

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

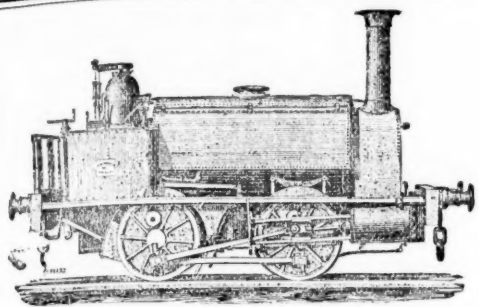
FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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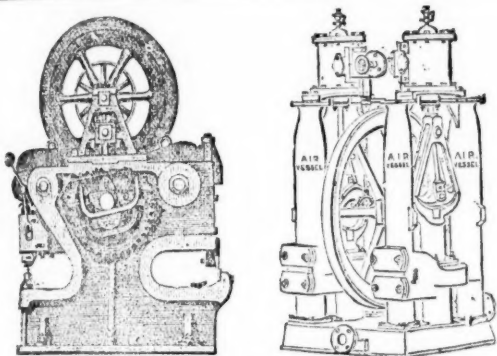
No. 2026.—VOL. XLIV.

LONDON, SATURDAY, JUNE 20, 1874.

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BICKFORD, SMITH, AND CO.,
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POOL; and 85, GRACECHURCH STREET, LONDON,
E.C., MANUFACTURERS AND ORIGINAL
PATENTERS OF SAFETY-FUSE, having been in-
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fuse not of their manufacture, beg to call the attention of
the trade and public to the following announcement:—

EVERY COIL OF FUSE MANUFACTURED by them has TWO SEPARATE
THREADS PASSING THROUGH the COLUMN of GUNPOWDER, and BICK-
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THEIR TRADE MARK.

For Excellence
and Practical Success
of Engines
Represented by
Model exhibited by
this Firm.

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ENGINEERS AND GENERAL MERCHANTS,
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MANUFACTURERS OF
PUMPING and other LAND ENGINES and MARINE STEAM ENGINES
the largest kind in use, SUGAR MACHINERY, MILLWORK, MINING
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In First-Rate Condition, at Moderate Prices.
PUMPING ENGINES; WINDING ENGINES; STAMPING ENGINES
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WORK of all descriptions, and all kinds of MATERIALS required for
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May be SEEN AT WORK at HAYLE FOUNDRY WHARF, NINE ELMS,
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TABLE GLASS OF ALL KINDS.
CHANDELIERS IN BRONZE AND ORMOLU.
Moderate Lamps and Lamps for India.
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BIRMINGHAM.....MANUFACTORY AND SHOW ROOMS, BROAD STREET
(ESTABLISHED 1807.)



PARIS.

ORDER OF THE CROWN OF PRUSSIA.

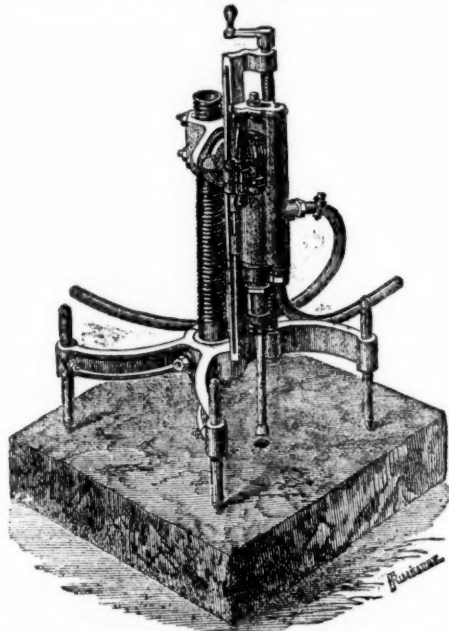
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MINES, TRIESTE HARBOUR WORKS, ALEXANDRIA
HARBOUR WORKS, AND IN VARIOUS TUNNELS,
MINING AND QUARRY WORKS, DEEPENING RIVER
BEDS, STONE-CUTTING AND CONTRACTORS' WORK
OF VARIOUS KINDS, WELL-BORING, &c.



McKEAN'S ROCK DRILL has the following
ADVANTAGES over ALL other MACHINES, viz.:—

- 1.—It is the simplest in construction, and contains the fewest parts.
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COPY OF LETTER FROM SIR GEORGE W. DENYS, BART.
Draycott Hall, Richmond, Yorkshire, May 11, 1874.
DEAR SIRS,—Messrs. Jeffrey and Nevin, of the Lead Hills Mining Company, came

here from Scotland last week to see the borer at work in Sir Francis level. They went back highly pleased with what they saw. The level, which is just now going at 47 per fathom, they stated could not be moved at Lead Hills for less than £15. Five holes, between 5 ft. and 7 ft. deep, had been bored during the shift, and were fired together with 50 charges of dynamite, getting, as you may suppose, a tremendous quantity of stuff, and filling the level right up to the roof. The old machine has been working first rate since you repaired it, and seems as good as ever. I think you will be hearing from Lead Hills before long, for seeing is believing. You can make any use of this you like.
Messrs. McKean and Co. Yours truly, GEO. W. DENYS.

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HESLOP, WILSON, AND BUDDEN,
NEWCASTLE-UPON-TYNE.

This PATENT APPARATUS is EXCEEDINGLY SIMPLE and INEXPEN-
SIVE IN CONSTRUCTION, and is so arranged as may seem best for assisting
the substances to be operated upon.

AFFORDS TO MANUFACTURERS AND OTHERS PERFECT SAFETY
UNDER THE SMOKE AND GASES ACTS.

More effective than condensing towers.

Large chimneys can be done away with. Succeeds thoroughly in condens-
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UTILISES ALL EMISSIONS.

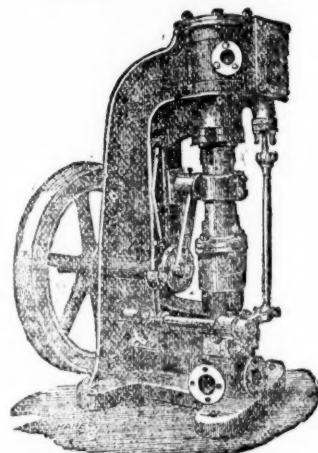
OF GREAT VALUE IN SMELTING WORKS.

The Machine can be seen at work at—

JOHNSON AND HOBBS,
No. 11, CROSS STREET, MANCHESTER,
Of whom also all particulars can be had.

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BIRMINGHAM ENGINE WORKS,
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MAKERS OF WINDING ENGINES,
VERTICAL DONKEY PUMPS, &c.



Stock Sizes, from 10 to 30 inch
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EITHER

MUNTZ'S OR GREEN'S PROCESS.

MUNTZ'S METAL COMPANY (LIMITED),
FRENCH WALLS,
NEAR BIRMINGHAM.

MINERS
PRICKERS AND STEMMERS
OF

MUNTZ'S METAL.

ACCORDING TO THE NEW MINES REGULATION ACT.
BEST KNOWN MATERIAL.

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NEAR BIRMINGHAM.



By a special method of preparation, this leather is made solid, perfectly close in
texture, and impermeable to water; it has, therefore, all the qualifications essen-
tial for pump buckets, and is the most durable material of which they can be made
It may be had of all dealers in leather, and of—

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TANNERS AND CURRIERS, LEATHER MILLBAND AND HOSE PIPE
MANUFACTURERS,

LONG LANE, SOUTHWARK, LONDON

Prize Medals, 1851, 1855, 1862, for

MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.



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SOLE AND EXCLUSIVE AGENT FOR

THE "KAINOTOMON" ROCK DRILL,

THE CHEAPEST AND BEST MACHINE FOR SINKING, MINING, AND QUARRYING.

"THE ECONOMIC" COAL CUTTER,

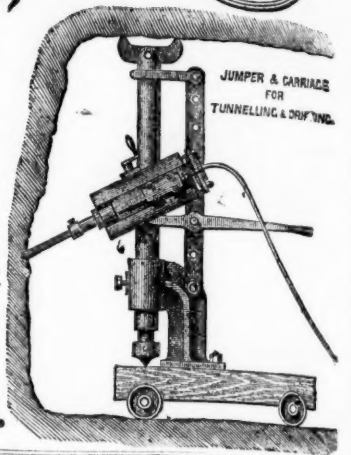
FOR SIMPLICITY, ECONOMY, AND EFFICIENCY UNEQUALLED.

ANDRE'S PATENT HYDRAULIC MINING PUMP,
AND SUPERIOR

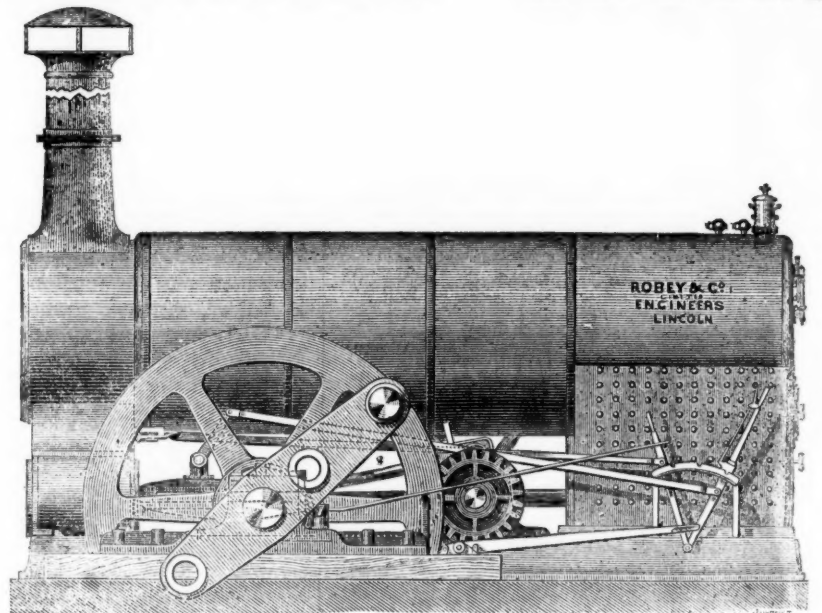
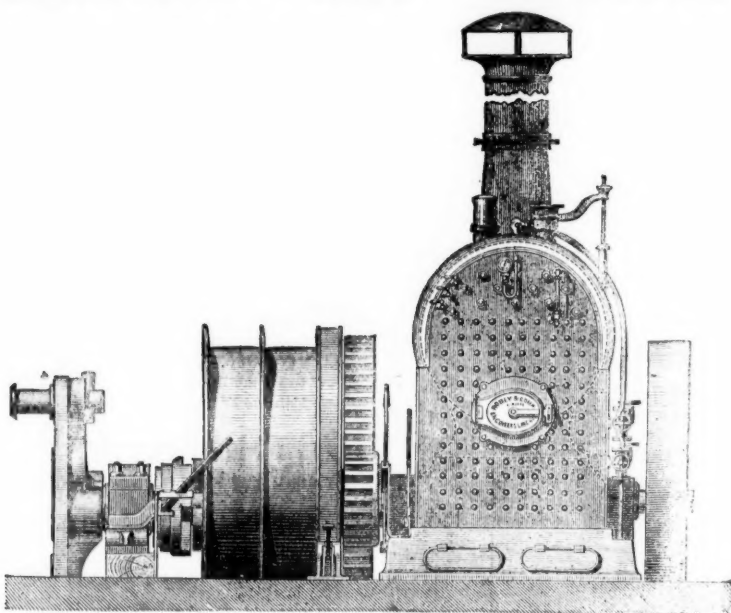
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ENGINEER AND CONTRACTOR FOR MINING MACHINERY OF EVERY DESCRIPTION.

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THE PATENT IMPROVED ROBEY MINING ENGINE.



Some of the advantages of this New Patent Engine are as follows:—

SMALL FIRST COST.
SAVING OF TIME AND EXPENSE IN ERECTING.
EASE, SAFETY, AND ECONOMY IN WORKING.
GREAT SAVING IN FUEL.

This New Patent Mining Engine is free from all the objections that can be urged against using the Semi-Portable Engine for permanent work, because it possesses the rigidity and durability of the Horizontal Engine, and at the same time retains the advantages of the Semi-Portable, in saving time and expense in fixing.

ENGINES UP TO 200 EFFECTIVE HORSE-POWER ALWAYS IN PROGRESS.

Prices and full particulars on application to the sole manufacturers:—

ROBEY AND COMPANY, LIMITED,
PERSEVERANCE IRONWORKS, LINCOLN, ENGLAND.



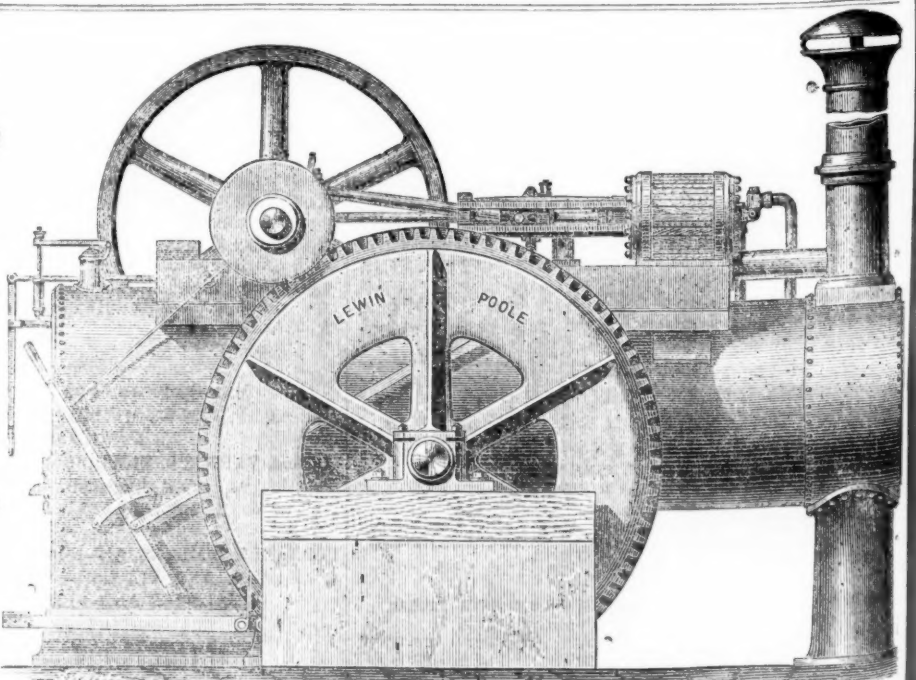
This is the best hand-worked implement for colliery purposes extant. It can be carried about, set up, taken down, and worked by one man. It bores vertically upward as well as in any other direction. The rate of work is at least four times as great as by the usual methods. The hole made is straight and uniform, and, therefore, specially adapted for the use of cartridges.

Price list and description, with list of places where the Perforators are in use, on application as above.

A Special Type for Overground Work and Shaft Sinking.

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WINDING AND PUMPING GEAR.

For catalogues and particulars, apply

S. LEWIN, POOLE, DORSET.

Original Correspondence.

A CASE FOR THE CERTIFICATED COLLIERY MANAGERS' ASSOCIATION.

Sir,—In last week's Journal you report a case of neglecting to report an accident which Mr. Wynne, her Majesty's Inspector of Coal Mines, preferred against the proprietors of Sneyd Colliery. Mr. Wynne sustained his case, and Mr. Greenwood inflicted a penalty of 5s. and costs, and along with this decision he laid down the law. He is reported to have said—"It must be clearly understood that notice must be given of every accident."

This Mr. Greenwood, I presume, is a Justice of the Peace; evidently he is not the "Coal Mines Regulation Act, 1872," as there is a difference between him and the Act. The Act says—p. 1, a 30: "Where in or about any mine to which this Act applies, whether above or below ground, either—(1) Loss of life or any personal injury to any person employed in or about the mine occurs by reason of any explosion of gas, powder, or of any steam-boiler; or (2) Loss of life or any serious personal injury to any person employed in or about the mine occurs by reason of any accident whatever—the owner, agent, or manager of the mine shall," &c., &c.

In cases of explosions by gas, powder, or boiler the law as laid down by Mr. Greenwood is right, but in other classes of accidents he is at variance with the clear wording of the Act he sits to administer. This is a point the managers of coal mines should take up at once, otherwise it will become necessary to station a doctor at the pit top to ascertain if any boy has fallen and hurt his nose, or scratched his finger with a pin.

COLLIERY VIEWER.

June 18.

CLEE HILL COLLIERY COMPANY.

Sir,—Your readers must feel greatly obliged to the author of "Mining Sketches" for the graphic description of the above property, which appeared in last week's Journal. His observations bear the impress of truth, and appear unanswerable. They cannot, however, be very palatable to our poor shareholders who have bought at a premium, but they apparently prove the statements made in the prospectus to have been utterly fallacious, as can be seen from the following extracts:—

These properties have been surveyed, first by Mr. Joshua Richardson, M. Inst. C.E., late Mineral Agent to the Earl of Craven, and also by Mr. John Brunton, M. Inst. C.E., F.R.S., &c., which latter gentleman was accompanied by Mr. Thomas Thompson, jun., who will join the direction after the allotment by Mr. Thomas Thompson, jun., and who did his utmost to sift the correctness of every statement put forward. The reports of these gentlemen accompany the prospectus. It will be observed that, while differing in some slight matters of detail, they agree in all the main features, one estimating the coal worked at 10,936,145 tons, and the other at 11,610,000 tons. In the reports will be found full particulars of the ironstone, Jewstone, or dunnstone, limestone, and fire-clay, enormous quantities of which exist in these properties, and are now being extensively worked.

Meers, Pearson, and beyond putting up a large amount of machinery and sinking a large number of pits, in opening out the mines, have allowed the management to take its chance, sometimes visiting the place only once in 12 months. Notwithstanding this, however, the coal and other minerals have been yielding a profit sufficient to pay a dividend of 12½ to 15 per cent. on the purchase money, but it is estimated that, with thoroughly efficient management and a judicious outlay of capital, this profit can be increased to 23,000 per annum, being upwards of 50 per cent. on the entire capital of the company. This calculation, however, is based upon a profit of only 2s. 6d. per ton for coal, which is less than was being made before the rise in prices took place.

It will be observed that Mr. Richardson estimates that, taking the coal to give a profit of 2s. per ton only, the present plant and works are sufficient to realise an annual profit of \$300,000, and upon this he values the collieries and plant at 71,626, but in making this estimate he reckons upon an out-put of only 200 tons per day, whereas the collieries are quite capable of giving an out-put of 500 tons, if not 800 tons per day, and the profit per ton should be greatly in excess of that stated by either him or Mr. Brunton.

The advantages to be derived by subscribers to this company are:—1. The whole of the coal seams, with the exception of the two lower, are drained by an adit level, which is of the utmost importance in mining properties; the coal, when broken, having merely to be brought to bank.—2. The property is in full work, and allowing matters to go on pretty much as they have done hitherto, and with no better supervision or management, will give a certain dividend of (say) 10 per cent. on the entire capital, and at the present rate of working it would take two or three centuries to exhaust the coal estimated to exist.—3. Under first rate supervision and good management, and with a judicious outlay of the company's working capital, there is an equal prospect of very high dividends, which Mr. Brunton estimates at over 50 per cent., taking a very low price indeed for the coal.—4. It is not a speculation, but may rather be considered a safe and lucrative investment.

The price to be paid for the property is 30,000, of which 12,000 is to be paid in cash and 18,000 in fully paid up shares. The agreement for the purchase is dated Nov. 14, 1872, and is made between Thomas Thompson, jun., of the one part, and Walter Harry Harrison, on behalf of the company, of the other part.

Now, the author of "Mining Sketches" states that he found the works at a standstill, and that, in spite of the unusual facilities for economical working, the cost of production of the coal has been 20s. per ton, and the selling price on the bank only 16s., and about 8s. for slack. It, therefore, the late owners, who, by allowing "the management to take its chance," could obtain dividends of from 12½ to 15½ on the purchase money "before the rise in prices took place," what term ought to be applied to the recent "thoroughly efficient management," who, under more favourable circumstances, have only been able to realise a heavy loss?

A great feature is made of the appointment of Capt. J. Kitto, of the Foxdale Mines, as the successor of the previous incompetent managers; and, like Cheap Jack's wares, the last is always the best. May it prove so in this case; but is a long experience in lead mines any special recommendation to the office of a colliery manager? Besides, I see that Capt. John Kitto's name appears in the prospectus upon the board of direction. How is it, therefore, that his great experience has not sooner corrected this extravagance and mismanagement, which for 18 months have characterised the proceedings of this company? Doubtless the shareholders will be glad to receive any explanation that can be offered.—London, June 17. OBSERVER.

THE EMMA MINE—AMERICAN PATENTS.

Sir,—I was very much struck on reading a remark made by Mr. George Attwood in his reply to "H. N." in the Supplement to last week's Journal, respecting the Emma Mine. In speaking of the "ore deposit," as contradistinguished from a true vein, he said,—"Its course is almost at right angles to the patented ground." From that remark it would appear that Mr. Attwood is of opinion that if a lode or deposit dips outside of the perpendicular lines of the patented parallelogram that it ceases to be included in the patent. If such were the case—which, as I understand the law, it is not—a United States patent title to a mine would oppose itself to the terms of the original claim, which secures to the owners the right to follow the fissure, whether in vein or cavity form, in whatever direction it may go, to the linear extent included in such original claim, having been first duly recorded. And hence, instead of strengthening and perfecting the title, it would expose it to additional dangers. If, then, the ore in the Emma Mine extended transversely to the patented ground from its initial point to the full linear extent specified in the original claim, the title would be good according to that record, and would be respected as taking precedence of all others subsequently recorded upon the same vein, whether comprised within or extending beyond the perpendicular lines of the patented ground, as marked off at the surface, as such limitations in no way affect or abridge the right and title to follow and work the lodes in whatever direction they may go, to the full longitudinal extent "specified," "claimed," and "ratified" in the district Recorder's book. But, on the other hand, if the vein, fissure, or cavity terminated in such a way that no venous connection could be traced between it and another vein or deposit which might occur in the vicinity, and which from the general aspect might be supposed to be related to or even identical with it, it would be extremely difficult to establish a claim and dispossess another occupier under such circumstances, unless extraneous influences were brought largely to bear in the contest, for this reason, that ocular proofs might be wanting; but if they were not entirely absent, what there might be used with fatal effect against the abettor of the identical theory.

If a United States patent or franchise restricted individual mines to the vertical area of their surface dimensions, as outlined and specified in the diagram upon which their transfer proceeds—for, to all intents and purposes, it is a sale by the United States Government to its individual citizens—such a restriction would practically involve additional liability to loss without securing in any way any conceivable advantage, inasmuch as the original squatter's title is

equally good, and infinitely less cumbersome and expensive in procuring, than the United States patent. That the earliest location will hold a mine against all invaders, notwithstanding that the direction of a lode may be mistaken, and found eventually to be longitudinally opposite to the direction it was said to be, in the notice furnished to the recorder of the district by the original locators, and by him duly entered in the mining records, has been proved in the Nevada law courts by the contest, a few years since, between the Eberhardt, Blue Bell, Keystone, &c., at White Pine; such a mishap being rendered inconsequential by the embodiment of explicit and formidable specific provisions for following the lodes respectively, whatever direction they may go in. My only object in troubling you with these remarks is to prevent, if possible, any misapprehension of the subject.

ROBT. KNAPP.

Llanrwst, June 17.

MINING IN UTAH—EMMA, FLAGSTAFF, &c.

Sir,—The Emma takes out daily 10 tons of high-grade ore; it would certainly be more if they had less water to contend with. There are large amounts of ore in the different levels, and also on the dump, which is second class, and amounts altogether to about 4000 tons. Three concentrators will start in a few days.

The Flagstaff has a body of ore, 20 feet thick, in the 180 ft. level. At the 700 ft. level they have also a large body of ore. The roads in Little Cottonwood are improving daily, and as soon as they are all right there will be a lively shipment.

The Chicago is doing very well.

The Mono Hoisting Works are complete, and they will start with full force. The entire profit of the Mono for the last two years is \$400,000, and from Jan. 1, 1874, until May 1, 1874, it is \$130,000.

Bingham Canyon has the greatest quantity, and Ophir the best quality, of ore in Utah. WM. BREDEMAYER, M.E. Salt Lake, May 27.

THE EMMA MINE—OFFICIAL INCONGRUITIES REQUIRING EXPLANATION.

Sir,—Last evening I received the printed notice, sent to all shareholders, that the third ordinary general meeting of the Emma Silver Mining Company (Limited) would be held on the 15th inst. The notice was accompanied by a number of reports, one from the Chairman of the board of directors, one from the board of directors, one from the committee, and one from Mr. Attwood; with the latter were five maps, or plans, consisting of, first, a geological diary showing anticlinal fold, &c.; second, transverse and horizontal sections; showing shape and size of ore deposit, &c.; third, a ground plan, showing position of Emma ore deposit in reference to porphyritic dyke found in the Beliance tunnel; fourth, a vertical plan; and fifth, a map showing the water rights claimed by the Emma company, and flumes built, &c. All the reports are most discouraging. Mr. E. S. Blackwell, in a report of June 7, 1873, says:—"The future of the mine depends entirely upon the virgin ground, and to explore this you must be prepared to wait some time and spend a large amount of money in developments." Mr. Clarence King, on June 11, 1873, says:—"The great Emma bonanza is, with insignificant exceptions, worked out." And Mr. Andrew Murray, F.L.S., &c., says, Aug. 5, 1873:—"In my opinion the famous Emma Mine is exhausted." If the mine was exhausted last August, how can we account for the paragraph under the head of finance in Mr. Attwood's report:—"The net return resulting from the working of your mine from March, 1873, to March, 1874, may be considered to be at least \$131,000, after paying all expenses, also numerous old debts, one of the principal of the latter being a county tax bill of \$10,000." Now, Messrs. Editors, we are assured by three prominent experts that the Emma Mine was exhausted last June and August; assuming that the mine yield was equal each month, over half the net returns (\$131,000) must have been extracted since the mine was reported exhausted! How do you explain this, and what was the gross yield of the mine? Furthermore, I learn from London that a report sent by an expert, who examined the mine as late as last month says that there is still a large amount of ore in the upper workings, which could be profitably concentrated. This gentleman could not examine the lower workings, as they were flooded, the pumps having been stopped four days before his arrival! I herewith forward you the reports, plans, &c.; you may find some interesting matter therein.

A REGISTERED EMMA SHAREHOLDER.

Salt Lake City, May 26.

"AN EXHAUSTED MINE."—In another part of these columns will be found a letter on the recent reports of the directors, committee, and manager of the Emma Mine, written by a shareholder who is evidently anything but a blind believer in the official statements published concerning the mine. These reports furnish somewhat curious reading, and induce reflections far from complimentary to the honesty of the officers and directors. They assure the shareholders that the mine is exhausted, but it is proposed to continue work; and strange to say Trenor W. Park is declared willing to wait payment of his claim until after the close of this year, and until this mine is in a better condition. Shrewd, keen, and far-seeing as Mr. Park is known to be, and thoroughly acquainted with the Emma, these gentlemen ask the public to believe that he is willing to postpone the collection of an amount due him until an "exhausted" mine is in a better condition. Mr. Attwood, in endorsing the statements of so called experts made as long ago as last August, that the mine was exhausted, tells how he has paid during the year a large amount of indebtedness, including a county tax of \$10,000; some of this indebtedness being unknown and unexpected; and yet he has had a profit of about \$130,000; in other words, in four or five months—up till August, when the mine was exhausted—he was able to pay all heavy indebtedness and secure for the company a profit of over \$130,000; if it is not reasonable to think that an exhausted mine could do more than pay expenses, if it could do that. And it made this profit despite the fact that Mr. Attwood must have been exceedingly generous, not to say lavish, in disbursing the company's funds. We find by his own report that over 11,000,000, sterling were paid for hauling some 5000 tons odd of ore from the mine to the railroad. This would be at least \$12 a ton for hauling, and considering all things we should think the teamsters ought to feel particularly grateful to Mr. M. for his liberality. The Flagstaff and the Davenport paid no such money.

The reading of these reports is slightly sickening; and makes one wonder if those who got them up imagined there was such a thing as a mail between England and Utah, by which they could be forwarded to this country, where they could be analysed and exposed.—Salt Lake Daily Herald, May 27.

KALOSIC GAS—NO. VII.

APPLIED TO IRON SMELTING.

One of the most important applications of kalosic gas to useful purposes is that to the smelting of iron, and by a very natural expansion to metallurgical processes generally. According to authorised returns, about 6,000,000 tons of pig-iron are smelted annually in the United Kingdom by the consumption of 12,000,000 tons of coal, or 2 tons of coal to every ton of pig-iron. Whatever the make, whatever the size, of a smelting furnace, whether 50 ft. or 100 ft. high, matters not. Its functions are many, and its moving powers are steam and brute force. The endless wagon is followed by the endless tip, and at certain intervals the white-hot spouting metal is allowed to rush from the tap-hole, and find its level in the trenched sand. Few or none stop to consider that this smelting-furnace is not a smelting-furnace merely. It is a lime-kiln, it is a gas factory, it is a distillatory and a huge glasshouse; and it is, moreover, a persistent producer on a large scale of remarkable chemical products besides iron.

Those issuing from the throat of the furnace have latterly been applied to useful purposes, and many efforts have been made, and are now making, to utilise the slag that streams from below. But what great improvement has lately been introduced into the body of the furnace—into the general system of reducing the ore? Since the introduction of the hot-blast, with all its regenerative additions, literally nothing. I do not speak of after operations, but of what takes place in the smelting furnace itself. There, and around, it is all high-pressure and unflagging competition—one blind and ceaseless struggle for gold. People have no time to think, except of how many hundred tons of pig-iron they can produce in the week, and whether its quality is up to the proper standard; and if Philosophy but show herself at the gates with any suggestion of improvement or economy she is pretty sure to be refused admittance. Yet who can doubt, upon a moment's reflection, that under this higgledy-piggledy, semi-barbarous system of reducing the metal from its ore, there must be an enormous waste of fuel constantly going forward, and not only that, but an enormous waste of time. Yes, time! Here is an appeal at once to the pounds, shillings, and pence side of the question—an appeal that will be listened to.

To prove this in a general way. If there is no coal in the furnace to ignite and distil, not only is one unnecessary complication thereby avoided, but a great cooling effect is got rid of also, the magnitude of which will be better understood by an illustration. In a smelting works, producing (say) 800 tons of pig-iron per week, no less than 1600 tons of coal, at ordinary temperature, are required to be heated to a white-heat; and, moreover, as a necessary consequence, to be distilled; both which operations absorb an immense quantity of useful and otherwise available heat. But this is not all.

The gaseous hydrocarbons so evolved are themselves decomposed with a still further abstraction of heat from the furnace. This decomposition has been abundantly proved by Bunsen, Playfair, and many other experimenters. At Alfreton, in Derbyshire, for instance, the proportion of hydrocarbons to hydrogen in the escaping gases was very small, and in other cases proofs are not wanting of their

total absence. The evil arising from these causes is directly proved by the fact that where the process of coking and distillation does not take place, as where charcoal is used, the body of the furnace does not require to be so high as in the case of a furnace where coal is the fuel employed.

But the most wasteful and destructive fallacy connected with the use of raw coal, or indeed of any solid fuel, in the process of iron smelting is this, that the ceaseless volumes of carbonic acid, formed by the action of the blast upon the white-hot coke in the crucible of the furnace, are no sooner generated than they are again converted into carbonic oxide, and thus doubled in volume; a change which is accompanied by an immense absorption of sensible heat, which rapidly reduces the temperature of the furnace above the crucible, and by cooling down the operatorist affinities impedes and slackens the process of reduction. From all these circumstances, and from the escape of unburned combustible gases, principally carbonic oxide, Bunsen and Playfair, from their elaborate experiments at Alfreton, already referred to, estimated that somewhat more than four-fifths of the total quantity of heat produced from the fuel was wasted. I am truly disposed to think that four-fifths of the time now consumed in the operation of smelting is being wasted also. Taking a very moderate estimate in this respect, however, I am satisfied that by the direct use of kalosic gas in smelting, three-fifths of the fuel will be saved; and, furthermore, that every furnace may be tapped four times in every 24 hours, instead of twice, as at present. This result in effect reduces the cost of iron smelting to less than half the price it is at present; and, at the same time, it doubles the productive power of all the furnaces of the United Kingdom, and therefore of all the world beside, where coal is employed as the reducing agent.

It has been stated that under the present system of smelting 2 tons of coal are consumed for every ton of cast-iron produced. Now, as I only require under my patent two-fifths the weight of coal or coke which are now needed for this purpose, I shall only require about 16 cwt. of coke (say) to the ton of iron. And, as a ton of coke produces 220,000 cubic feet of kalosic gas—there or thereabouts—so 16 cwt. will give 171,000 cubic feet. Let us suppose that the iron run off at a single operation is equal to 15 tons. Then the quantity of coke required for its reduction would be 12 tons—equal to 2,640,000 cubic feet of gas—a quantity easily produced in 12 hours—6 hours—or even much less, with my most simple generative apparatus, whose action is constantly maintainable at almost any velocity of production, and which is throughout totally independent of retorts and nicely adjusted mechanism. The only qualification that might be found necessary would be a very small amount of solid fuel in the furnace to aid in the support of the charge. Now, when we think what a powerful torrent of intense flame may thus in an instant be poured through the largest furnace, the chance of its ever setting must be very remote. The matter is so completely under command in every respect when gas is used as the fuel, that there will now be no difficulty in making Sunday a day of rest both for miners and smelters.

Such a command of heat also, as before said, cannot fail by exalting the affinities to quicken and to expedite the process immensely. There is nothing absolutely necessary to the operation in these long hours of smelting. Circumstances alter all things. In place of the 12 hours we have been considering, in Cleveland the time of descent is about 36 hours, and in the older blackband furnaces of Scotland it is from two and a half to three and a half days; while, on the other hand, in some of the continental furnaces, as those of Styria, where the ores are chiefly spathic and the fuel is charcoal, the smelting speed is express, and the tapping takes place at intervals of every two to two and a half hours. I merely wish to point to the fact, and to show that by the removal of the drawbacks above referred to, and with the aid of such a powerful agent as kalosic gas, the process of iron smelting may be wonderfully expedited and economised; to such an extent, indeed, that four furnaces may be made to do the work of eight, and at a saving of more than a clear half of the fuel.

The latest improvements in kalosic gas, however, carry us further than this, for this powerful gas may now be made in any quantity from common slack at a total expenditure of only 1d. per 1000 cubic feet, including material, labour, and every other charge. The further application of this important gas to puddling and forging, as well as to general fusions and metallurgical heat processes of every character, I hope to expound in future communications.

ISHAM BAGGS.

"THE SCIENCE OF INNESTMENTS."

Sir,—At this time money is abundant, and the surplus wealth of the civilised world flows into our coffers. Australia, New Zealand, and our colonies open out their riches, extend our commerce, absorb our surplus population, and send their gold and productions to the Mother Country, adding volume to our manufacture, and taking in exchange our machinery, fabrics, and the products of skill, industry, and enterprise. Why, therefore, should the artisan, the miner, and the agriculturist have cause to strike, and thus paralysing the trade of the commonwealth, and snap asunder the mainspring of confidence, which alone constitutes the basis of prosperity and progress? The promise of an abundant harvest is well secured, the spring has been most favourable, and the season has happily advanced with every chance of warm and congenial weather, to ripen the crops, and yield us a bounteous supply of corn and the sustenance of man and animal life; still the agriculturist is dissatisfied, and the leaven of discontent is far spread, and extending; while grave are the seeds that threaten to disturb the labour market, and shorten the supply, when the sickle should be active and the husbandman at work. Yet, in the face of all these dangers, the Legislature of the country is silent as to the future, and no remedy appears in possession or in prospect to contend against the breakers discernable ahead. Should the agriculturists turn out, and the crops be threatened with destruction whence, let us ask, can come the hands to reap the corn and gather in the harvest which a bountiful Providence is to all appearances about to bless us with? In reply, we state that the Government must lend us the volunteers and militia, and thus supply the deficiency of rural and agrarian labour. The necessity, "as the volatile French legislator would assert," is urgent, and Parliament ought at once to stifle the growing suspense, and announce its determination to come to the rescue. Strikes are all well enough when confined to mining, manufacture, and construction, but in respect to the indispensable productions of nature, essential to the very existence of animal life, legislation is demanded whenever combinations are formed, aggravated, and fevered through purient democrats and incipient anarchy. Thus the present is an occasion wherein a Conservative Government can assert its power, and come to the deliverance of the people, while possibly the urgency of the question may lead to legislation on the all-absorbing and momentous relations of labour and capital, for each has its duties and its rights, and both should be amalgamated, though they now stand, unhappily, at variance, and in cases practically divorced.

In the face of these dissensions can we wonder that capital finds its way abroad, and that now we have far more than twice our national indebtedness invested in foreign countries? For instance, Egypt owes us above 60,000,000, Turkey 120,000, Italy about 40,000,000, Peru 12,000,000, Portugal 64,000,000, Spain 237,000,000, Russia 130,000,000, United States 300,000,000, France 250,000,000, whilst Turkey, and almost every other country, are still borrowers, and offer capitalists tempting and remunerative interest for their money. And what are the consequences of these vast receptacles and still extending channels for the absorption of England's wealth? Why, diminished enterprise at home, and the construction of railroads, canals, docks, vessels of war and shipping, with competitive manufacture and commerce against us, while we possess mines of wealth at home and in our colonies that languish for that support which we are driven to extend to the foreigner.

With the above reference to foreign loans, and the sinking of English capital in foreign countries, we take this opportunity of directing attention to British mining and home industries, compared with "betting on the Derby" and horse racing. No matter what the pursuit or security, we may observe that when the investor has incurred his adventure he must keep his eyes open if he would make the most of his opportunity, for it is not all who win at the Derby, or

even in such prizes as the Devon Consols, Minera, South Cardigan, Van, Tincroft, Dolcoath, or any other mine; while all should remember that each and all of these undertakings were once in their infancy, and presented no greater chances of success than many a struggling progressive and partially open mine does at this moment; thus, we may observe that it is from the latter that frequently spring those great and startling "creations" of wealth that fascinate the public, while they add greatly to the increase of labour, merchandise, manufacture, trade, and commerce; but not so with horse racing, for Lord Tomnoddy, of St. James's, knows nothing of opportunities or the "Science of Investments." He will give or take "odds" on the favourite for the "Derby," which may or may not turn out a grand opportunity for making money or for losing it, but the chances are at least even if not dead against the indolent recipient of an ancestral rent roll. A stable boy at Tattersall's has the "odds" much more in his favour than Lord St. James; and as the balance of betting on a race must be precisely poised, inasmuch as one wins precisely what another loses, while at the same time the habit of betting is costly apart from the risk, it must be very clear that the Corinthian class lose on balance. The excitement may be very enticing, and the squandering of money easily earned may be the habit of English gentlemen who have nothing else to do, but it would be much better for us all if those gentlemen born with golden spoons in their mouths would turn to something useful, and make that their study instead of "odds" on horses. There are plenty of opportunities in investing with gains which racing will not give; and if some risk is necessary to spice the occupation, that is amply furnished in the ordinary channels of commerce, but with this essential difference—that investment need not be gambling. Some men of fortune devote all their time and energies to a betting-book, thereby showing that their native intellect requires some vent in form of buying and selling; and if this is one of the conditions of human existence, why should not the propensity be directed to some useful channel? A telegraph or a railway share, a mine share, or that of one in a bank, shipping dock, canal, insurance, gas, or water company, must do good to somebody, but a "Derby" never did any good to anyone in proportion to its evils. Some have done good by a "Derby," but the majority have lost; while by the Great Western, Northern, London and North-Western, and other railways, various telegraphs, the Fore-street Warehouse, and numerous commercial and trading companies, the London and Westminster, Joint Stock, London and County, Union, National Provincial of England, and a host of banks, with the general mining interests of the country in the production of coal, iron, copper, tin, and lead, which have raised their products second only to agriculture, all the nation has been benefited, while the large majority associated therewith have won. This is not the case with horse racing, for it is purely gambling.

The year 1868 was stamped in the most emphatic manner as one wherein capital for a long time lay dormant against the resuscitation of enterprise. The crippling complications, bankruptcies, and disasters that culminated in 1866 were then keenly alive throughout the length and breadth of the kingdom, yet, weary of the low prevailing rate of discount (2 per cent.), they yielded to the solicitations and force of high interest paid on foreign loans, chiefly Russian railway schemes of great magnitude, and which amounted from August the previous year, to the end of November, 1868, to no less a sum than 90,000,000*l.*, and on the 17th of that month the shipment of 1,000,000*l.* in gold to Russia raised the rate from 2 to 2½ per cent. at the Bank of England, it having stood at the former nominal figure for no less than 69 weeks. On Dec. 3 it advanced to 3 per cent., and during the following year we had frequent changes and higher rates. These arose almost entirely from the introduction and adoption of foreign loans. As home enterprises were long after all but neglected, the trade of the country being greatly depressed except in respect to iron rails and the extraordinary rise in tin. The harvest, also, was an unusually good one. At the present moment, like the year 1868, we have abundance of money, and the rate is likely to sink low—probably as low as 2 per cent.—and we are threatened with a host of new loans. In respect to Turkey alone, no less than 75,000,000*l.* 3 per cents., while America, France, Spain, Egypt, Russia, and almost every other State and country, will attempt to draw our money away. So long as the strikes continue high prices of coals and materials will be maintained; so long will home speculative undertakings be unsettled and our industrial interests suffer. The inflexible and disastrous results will fall on and be sustained by the masses—so long as strikes continue so long will the social well-being of the working community retrograde. Nothing nourishing or even refreshing ever sprung out of chaos.

R. TREDINNICK,

Consulting Mining Engineer, and Dealer in Stocks and Shares,
32, Fleet-street, E.C., June 15.

SLATE QUARRIES AS AN INVESTMENT.

Sir,—I was pleased to find an article, under the above heading, in the Journal for June 6, by Mr. Edward Betteley, calling attention to the quarries in the Festiniog district. All who have visited that district in the character of observers cannot fail to come to the same conclusion as Mr. Betteley. Were the same gentleman to pay a visit to the Bethesda district, in the neighbourhood of the celebrated Penrhyn Slate Quarry, near Bangor, he would be astonished at the pregnant riches of the place, which, for many miles, is literally bestrewn, even on the surface, with slate rocks of the best known quality. One quarry has of late been opened opposite the Penrhyn Slate Quarry, by a gentleman from the neighbourhood, to prove the vein, and though it has been worked only a little over two years, it has been amply ascertained that its resources are of such immense magnitude as to be simply exhaustless. It is really quite surprising how British capitalists are attracted abroad to embark in doubtful speculations, leaving unheeded such immense wealth, so very accessible at home, to slumber through all the ages in perfect oblivion. And, after all, it is a patent fact that orders for slates have often to lay unexecuted for years.

E. W. JONES.

Ogwen-terrace, Bethesda, June 15.

CALLINGTON AS A MINING DISTRICT.

Sir,—The strata are in the killas formation, near the granite. There are 15 parallel tin and copper lodes within 1½ mile of the town. There are several cross-courses also, some of them producing good quantities of silver-lead ore. Within the last 25 years there have been 15 steam-engines pumping from as many shafts; now there is but one engine left working, and not much doing there. The shafts are not sunk far in many of the so-called mines, the deepest—Hitchins' shaft, at Holmbush—is 147 fms. under adit, and the least is only sunk 10 fms. under adit. Most of the lodes are well defined, and have a very kindly appearance, but in many instances they have never been proved; even the deepest is not more than one-half the depth of a great number of our Cornish mines. The neighbourhood has been condemned for years past as a poor district, but the lodes have never been proved to see what they really are worth. Old Wheel Brothers is a proof that things were not formerly looked after as they should have been, as it is now paying very well, by working over the old burrows only. Now Dr. Emmens has commenced thoroughly to work Holmbush, Redmoor, and Kelly Bray as united mines, we wish him success. I believe there are other abandoned mines in the district quite as good speculations, with shafts sunk in firm ground, and good strong lodes laid open; the money already spent, although lost to the last parties, would be a great advantage to whoever may re-work the properties. This district has always been condemned as a mining district, but there is not one of the sets that has been proved yet to any great extent. The money has been expended at and near the surface. I should very much like to see some parties take up these abandoned mines and show the public what can be done with a small capital. At one of these abandoned mines 16 of us, working there on tribute, offered to work the mine at 15*l.* in 1*l.*, after the order came to stop working. We to provide coal and every other expense—tin then selling at 35*l.* per ton. The engine-shaft is 50 fms. deep only, sunk in blue clay-slate, and will stand good any length of time. Another shaft is sunk 40 fms. on a silver lode; the same lode where Capt. Doble is making such returns from the burrows only in the adjoining sett.

There is one thing I should like to call the attention of some of our mining engineers to. I think the old method of stamping tin-stuff could be done away with, and a better method of cleaning the tin by having a powerful crusher constructed, so as to crush it to any size required, by bringing the rolls nearer together, by the same kind of screw used in sawmills, and to have different sized sieves, so as to get the stuff to any size the nature of the tin required; then all the stuff to be treated the same way as silver-lead ore is treated. I believe by this treatment there would be a great deal less tin go to the Red River, and much speedier to get through with a large quantity, and at much less cost to lay out in tin floors.

Callington, June 17.

JOHN BUCKINGHAM.

PENNERLEY MINE, AND ITS MANAGEMENT.

Sir,—I notice the remarks of "Another Subscriber" in last week's Journal, wherein he states "The agents have reported improvements every week, but until, I think, the last sampling have only returned 75 tons a month; last month, by an extra effort, 80 tons." Now, with your permission, I will just give "Subscriber" the history of Pennerley for the past six months. The latter part of last year the old mine would barely produce 70 tons a month in time to sample, but so soon as Potter's Pit entered on regular runs of ore 70 tons was got without difficulty, then 75, then 80 tons, at which time 20 tons might be seen on the floors towards another sampling, saying nothing about the large heaps of ore accumulating underground. The old mine is holding her own, and Potter's Pit is opening splendidly. The latter may be classed of itself a rich mine. There is little doubt that Pennerley will be in the market before the end of the year with 120 tons a month. The mine is very well managed, and if all others were conducted on the same sound principles "Subscriber" need not be so cautious in going into a mine.

ANOTHER SHAREHOLDER.

PENNERLEY AND TANKERVILLE.

Sir,—I see an enquiry from "A Subscriber" asking why the shares of Pennerley and Tankerville should have so different a market value if both mines are producing the same amount of ore. This gentleman is probably a stranger to the Shropshire district, and let me advise him to go into the district and examine the position of the different mines. Without going below ground, he will notice that Pennerley at present is the more distant from a good road. If a railway is made through this district the working expenses of Pennerley would be so lightened that the value of the mine and of the shares in it would, of course, be enhanced. Tankerville, though it would benefit much from a line, would not benefit, perhaps, in an equal degree. The land for a railway is said to be all obtained. This shareholder had better support the projected line if he wants his shares to rise in value.

June 18. MINERAL RAILWAY.
[For remainder of Original Correspondence, see to-day's Journal.]

THE CARDIGANSHIRE MINES—No. 1.

Following our old and respected correspondent, the late Captain Matthew Francis, who kept us so well informed upon all matters concerning Welsh mines, his brother, Capt. Absalom Francis, is now giving his attention to the history of the mines of the district, having just published an interesting little volume,* describing not only what has already been done in them, but also their present position and prospects. His record embraces no less than 134 mines, and as these are referred to according to their geographical position, the relative prospects of the younger mines can readily be judged of. Commencing at the north of the county, he first notices Ystrad Dynon, the lode in which shows good lead and copper ores; he is persuaded that in depth a good mine will be opened out. He refers favourably to Ynystyrol Mine, unfavourably to Tre'rddol, and would not be inclined to invest in Llan Cwm Felin. Cardigan Bay Consols, embracing Bryn-Arian and Pensarn, does not appear promising; rich ore is found by the bunches, but are short and unreliable. Pwll Roman or Dolelettur, at Taliesin, has been several times worked; good copper and lead are now being obtained from it. The character of the lode is good, and he is inclined to believe that if the engine-shaft were sunk 20 fms. deeper, and levels extended eastward, good results would follow. To prove the mine thoroughly he considers a capital of 5000*l.* should be raised.

Penpompren has been worked most extensively for some centuries past, the main, or Penpompren, vein having been worked away for more than ½ mile in length over different adit levels. Capt. Francis considers this one of the champion lodes of Cardiganshire, as it is the same as that of the celebrated Esgair-hir Mine. In Pen-y-bank and Erglwydd there are three lodes, which all run into and form a junction with the main lode of Penpompren. At these junctions good courses of lead and copper are found. The vein is from 6 ft. to 8 ft. wide, and is well filled with blende, copper, and lead ore, the matrix being a good gossan and crystallised spar. He should fancy there must be a great deal of ore unexplored in this ground, and which will some time be found when proper trials are made for proving these mines, which are now granted with Penpompren. That ore in considerable quantities may be extracted from Tan-y-allt there is, he considers, no question about, but that a sufficient quantity to meet the expenses of working it can be obtained is very doubtful to him, and it is one of those concerns which he would not consider as a desirable investment. All-y-Crib has been worked for centuries past with varied success. It is at present worked by a good spirited company, and a small dividend has been paid. The deepest workings have been sunk but little deeper than they were more than 200 years ago. This will now have to be attended to, and he has no doubt success will attend their efforts. Cwm Lery, to the west, was never worked extensively, but the lode, which crosses the river a little below the village of Talybont, contained some lead ore at surface or in the river's bed, which led to the sinking of the shaft for some few fathoms deep. In driving this work some good lead ore was raised from it, and the stuff obtained has a very healthy appearance. From West Blaen Caelan no great quantity of ore has yet been got. Blaen Caelan appears to offer questionable prospects. He believes the lode already worked on in this mine is the principal part or portion of the Esgair-hir great lode, and that depth in this property is requisite for the finding of bunches of ore in paying quantities. Esgair-hir is one of the very old properties that has yielded immense quantities of both lead and copper ores. The present company have had the property about two years, and have added considerably to the machinery formerly on the mine, and they have recently struck into solid courses of lead ore from 2 to 3 ft. wide, which are continuing to open out in length, and at no distant period this property must, he considers, unquestionably stand foremost amongst the dividend-paying mines of Cardiganshire. He believes that immense bodies of lead will be found under the copper.

At Eaglebrook they are laying open good paying ground. In Cwm-dwr Bach, to the east, wherever the lode has been cut into good ore has been found. At Hafan and Henfwelch, although a great deal of money has been expended in making trials, they have never been attacked as they ought, and the principal part of the ore ground has never been seen in the adit level driven in some hundreds of fathoms for that purpose. From Bwlch Stellyn, southward, no returns have been made. Cwm-dwr Mawr, to the east of Bwlch Stellyn, has two very fine lodes; he believes that with a good field of machinery, good management, and 5000*l.*, the property could be made to pay good profits. At Nant-y-mach there is no doubt in his mind that in opening east and west on the course of the lode, as well as north and south on the cross lode, immense bodies of lead ore will be laid open. North Plynlimmon is not worth working, being Crown property, with 1-12th dues, and other absurd conditions. Plynlimmon, if worked more energetically, would, instead of being scarcely able to meet costs, make excellent profits. Cynell Fawr is unworked, but worthy a trial. Elgar is opening out a very valuable property. At Court Grange, to the west of Elgar, there is a great piece of unexplored ground on the main lode east of the present workings, which when tried, and this should be done at once, would prove to be ore-bearing from every appearance of the vein at surface. Mynydd Gorda, with a moderate amount of capital, and with proper management, is, he thinks, safe to become a very profitable and lasting property. Tynewydd, if it could be obtained at a moderate royalty, is well worthy of a trial. At Tynant, or West Esgair Hir, they are laying open rich courses of silver-lead ore. Penpompren, by Cefn Gwyn, requires a small capital to put it into a profitable state. He would not recommend the expenditure of large sums of money at Cefn Gwyn, to prove what may in the end turn out unprofitable; he proposes cheap trials instead. Of the Pont Goch lode he does not entertain a favourable opinion. Llanerch deserves fur-

* "History of the Cardiganshire Mines from the Earliest Ages to A.D. 1874, with their Present Position and Prospects." By ABSALOM FRANCIS, Mining Agent, Engineer, and Surveyor. Aberystwyth: Morgan, Pier-street.

ther trial. Llawn Cwmbach requires extensive machinery, but is likely to turn out rich and favourable in depth. Lletty Evan Hen, to the south, is united to the Vaughan Mines. The vein is of great size, but nothing seems to have been obtained from it. It is of the same with Llechweddaleg, also forming part of the Vaughan. At Bronfloyd the course of ore yet developed is of no great length, but he considers other courses will be found in the grant. At West Bronfloyd depth is required to get into good lead-bearing ground. At North Bronfloyd a vein has been intersected of some promise, containing a good mixture of lead ore.

Great West Van, formerly called Esgair Lle, does not yield sufficient ore to pay the cost of raising; it is many miles from Van. At West Esgair Lle they are making their trials fairly, and he has no doubt that success will attend their operations. At Bryn Glas he has every confidence of their being rewarded for their outlay. Bryn Weath, or West Bryn Glas, Capt. Francis describes as a good property, which will undoubtedly be soon developed. Corbett's Mine has produced a very good pile of lead ore, which is now on the mine. At a moderate royalty Hirnant Mine would be worthy of trial. Nant Caerhedyd is in the same position. At South Plynlimmon they have not been successful, but the bottom levels are promising. Dinas has a promising but unproved lode. Tynrhos has a vein 1 in. wide. Cardiganshire has a vein which, if properly tried, will, he thinks, undoubtedly lay open a good mine. The Bg lode is not large, but he believes that if the mine were opened out thoroughly it would give success. From Llywernog during the last 35 years no good result has been obtained. In Powell United there is good ore ground, and profits are anticipated. For Clara Consols Captain Francis prognosticates a good future. West Powell is, he thinks, certain to open out at an early date into a good dividend-paying mine. Cwmbrwyno is from all appearance on the eve of entering the Dividend List.

The East Darren, in the hands of Messrs John Taylor and Sons, is one of the best dividend mines in the county. At West Cwmymlog, Capt. Francis thinks there can be no question about finding ore again, but it will require a considerable capital and some years to place it in a profitable state. Cwm Darren is of doubtful value. Great Darren will require much time and outlay before it is made to return profits, but he considers that it is now promising. Junction Mine has two lodes passing through it. South Darren looks well, particularly in the bottom levels. Capt. Francis is persuaded that Cwm Erfin, with a moderate amount of capital, and under proper management, can be made rich and permanent. Bwlch Consols has a good course of ore in the bottom. Cuenant requires capital to permit of its being profitably worked. Pencraigda has a lode which carries a good gossan, and has as fine a back as any in the district. At Level Reich much work has been done, to a depth of 80 fathoms.

Goginan, if it had been fairly worked, would, he thinks, at the present moment be the richest mine in Cardiganshire. West Cwm Erfin would, with 5000*l.* judiciously expended, in all probability become a permanent dividend-paying mine. At West Goginan they have opened on the lode in the adit, and are now sinking a shaft on its course under the adit, the vein producing in all the workings a small quantity of lead. West Blaendyffryn has a lode composed of a nice looking quartz and gossan. Blaendyffryn is likely eventually to become a paying mine. At Nant-yarian sufficient has not been done even to speak of the probabilities of success. Nant-yarian will, he thinks, with the present price of blende, realise handsome profits. West Nant-yarian is a very promising piece of ground. Esgair Gwynion, on the same lode, is well deserving a good and spirited trial. Crown Mine is, probably, on the great Van lode; the lode may be ranked as one of the champion lodes in Cardiganshire.

From the above, which may be regarded as the crude facts given by Capt. Absalom Francis, the general character of his book may be judged of, though the extracts are culled from only 60 pages of the 150 of which the book consists. The work will prove invaluable, not only to those interested in Cardiganshire mines, but to investors generally, and in next week's Journal we shall collect the facts from the remaining portion of the book.

CORUNDUM—ITS HISTORY AND USES.

As steps are now being taken to turn a valuable deposit of corundum to commercial account, by the formation of an English company with an adequate capital to develop it, the exhaustive article just published in Messrs. D. Appleton and Co.'s "Popular Science Monthly," of New York, will not be uninteresting. It is remarked that, although corundum has been in use as an abrasive from an early age and under various names, it was not until near the commencement of the present century that its localities were found and examined by scholars, and its true place in mineralogy determined. For thousands of years the Chinese had used it, under the name of adamantine spar; the Persians, as Armenian whetstone; the Hindus, as corundum; and the Egyptians, as the stone of the Red Sea. The natives of these countries had gathered it from the beds of mountain torrents, or in the alluvium of the v. l'ays, after the annual rains had washed it down, freeing it, in the transit, from its associate minerals and impurities; but no attempt at its legitimate mining had ever been made until within the past two years, in the United States, in the State of North Carolina. The mineral, from whatever locality it comes, is now known in science and commerce as corundum—the name given it by the Hindus, and meaning cinnamon-stone, from the resemblance in colour to that article of the variety found in their country. It is pure crystallised clay or alumina, and is the next hardest substance in nature to the diamond, reducing to powder all substances save that gem.

Until the researches of Haiyi, the distinguished French savant, about the commencement of this century, the three forms of alumina known as sapphire, corundum, and emery were supposed to be distinct species. His analyses made them three varieties of one species, a decision confirmed by chemists since, and now universally accepted. The earliest extended reference to corundum of any value to science or trade appears in a joint paper by Count Bournon, of Paris, and Sir Charles Greville, of London, prepared for the Royal Historical Society of London in 1798; which was soon followed by a more careful mineralogical treatise by the first-named scientist, prepared by him for the same society. Sir Charles Greville's observations were based on data collected by him at a point in the alluvium in India where the natives had for ages gathered the mineral. Those by Count Bournon were the results of his studies of the mineral at Paris, from specimens brought him from several points, especially in India and Ceylon. At a later date we have interesting information from Sir Alexander Burnes as to the celebrated ruby locality of ancient Bactria; and from Sir James Tennant and Sir Samuel Baker as to the famed sapphire districts of Ceylon, which were carefully examined by them during a protracted residence there. A most interesting account of these localities was also published in the "Ceylon Observer" for June, 1855, by Mr. William Stewart, of Colombo. In the "American Journal of Science" for the years 1850, 1851, and 1856 are three papers on granular corundum, or emery, by Dr. J. Lawrence Smith, of Kentucky; the first two descriptive of the emeries of Asia Minor and localities on the islands of the Aegean Sea; the third on the mine in Western Massachusetts, known as the Chester Mine. These papers are of the first importance in all questions concerning the commercial emeries of our own or foreign countries, and cover the ground of investigation to the date of the North Carolina discovery, and the communications thereon enumerated in the opening paragraph of this article.

Up to the date of 1871 corundum, or its gems, had never been found in quantity *in situ*. Both were looked for in mountain torrents, or beds of gravel at their base. Emery had for many years been mined in the islands of the Aegean Sea, but had not been scientifically studied in position, until the researches of Dr. Smith, alluded to; since which date, however, it has been found in place at various points in our own and other lands. About the year 1860 it became known that corundum existed in small quantities all along the mountain line of sea coast, from Maine to Georgia; and 25 years since it was found in boulders, in considerable quantities, in South-Eastern Pennsylvania. Near the same time a large fragment of massive sapphire was picked up in Western North Carolina, and elicited much attention from mineralogists; but careful further

HOLLOWAY'S PILLS remove debility, biliousness, liver and stomach complaints. This inappreciable medicine is well known throughout the world, and its high performance by its use as so wonderful that it now stands pre-eminent above all others for the cure of bilious and liver complaints, dyspepsia of the stomach, drop-sy, and debilitated constitutions. In these diseases the beneficial effects of the pills are permanent; the whole system is renovated, the organs of digestion healthfully roused, and free respiration promoted. These salutary steps are gained without any drawback, since the pills purify and strengthen simultaneously; they improve the appetite, stimulate the circulation, and rouse the nervous energy necessary alike for comfort, health, and for both bodily functions and mental operations.

Meetings of Public Companies.

HOLCOMBE VALLEY GOLD MINES COMPANY.

A special general meeting of shareholders in this company was held at the offices, Austinfriars, on Tuesday, to take into consideration the advisability of completing the share capital, with a view of providing funds for the better prosecution of the company's business, and to pass the necessary resolution relating thereto.

Mr. COURTNEY in the chair.

Mr. W. J. LIVINGSTON (the secretary) read the notice convening the meeting.

The CHAIRMAN said that at the meeting in October, and in the report issued in anticipation of that meeting, attention was particularly directed to the necessity of speedily raising fresh capital, or, rather, of placing the forfeited shares. At that date it was their intention to erect a 10-stamp mill, but subsequently it was found impossible to do so, for this reason. Before the advices could reach America some time necessarily elapsed, so that the machinery for a mill could not possibly be taken to the mine and erected before the winter. Moreover, Mr. Bowe, who at the time was in California, after consulting with Mr. Haley, resolved to postpone erecting the 10-stamp mill, but at once to get five stamps put into the old mill, so as to thoroughly test the ore. It was with difficulty that was done, because the winter set in before the stamps could be got to the mine. This mill, however, was put to work on Jan. 15, but shortly after the water in the reservoir ran short; when this and other difficulties were overcome the mill was re-started on February 2 and run till March 1, when it was again shut down for want of additional shoes, which could not be got to the property during the winter. But the mill ran 23 days, and during that time treated 150 tons of refuse rock, and 50 tons of rock such as is now exposed in the mine. Mr. Haley says he is perfectly satisfied with the result of the test, and is certain the ore will give \$30 to the ton. It would appear that the 50 tons yielded \$15 to \$16, and the 150 tons refuse \$4 per ton; but all are aware that at the commencement of such operations it requires 50 per cent. of first run to coat the plates, so that Mr. Haley is of opinion the ore should run the very high average he has indicated. The actual amount returned was \$1342. The mill was again started up on April 1 and ran till April 30. During that time 151 tons were treated, but the result has not yet been received by written advice. Mr. Haley, in a letter published last week, stated he was going to Los Angeles, and would take the bullion with him, and advise the result. On June 7 a telegram was received which is not easy to interpret by itself, but taken in connection with the letter something could be made out of it. The telegram ran thus: "Free gold, \$12; sulphurets, \$30." They interpreted it to mean that the last run of ore yielded in free gold \$12; and the sulphurets \$30 per ton. This is important, because it shows an extreme richness of ore in sulphurets. They had always been told the ore was rich in sulphurets, and one reason why Mr. Haley had been unable to pay expenses was that the gold in the sulphurets could not hitherto be saved. Assuming that the 20 tons contained 5 per cent. of sulphurets they should produce 1 ton of sulphurets, and in a letter they had recently received from Mr. Bennet the assay value of the sulphurets were put down at from \$100 to \$100 per ton. If this telegram has been correctly interpreted, the sulphurets were of a much higher value still, but he would shrink from reckoning the ore at so great a value. The important point to consider was that this ore had been taken from the 50 feet level. Mr. Haley says "The ore in the 50 is by no means equal to that in the deeper part of the mine—the 120 feet level." Mr. Haley had been unable to work that deeper level, because the pump had to be taken from the mine and used for other purposes. Since the last meeting the mine had gone on gradually improving. Last May they were all startled by Mr. Haley announcing that the ledge had become poor, that the prospects of the mine were bad, and that he had stopped the building of the 20-stamp mill. In a few months an improvement took place, and up to the present time the mine had gone on steadily improving; and he (the Chairman) need hardly say that he was extremely glad to find Mr. Haley's tone had now completely changed. Mr. Haley now says—they are perfectly justified in going on and erecting a 20-stamp mill. The ore in the 120 ft. level will run \$30, and Mr. Haley would not be surprised if it gave \$60; it should be recollected that the original estimates were based upon \$15, so that under any circumstances they could safely reckon on the original computations being fully realised by actual results. But it now became a question what they were to do—they had at their disposal some forfeited shares, and they were hoping that Mr. Haley would have offered some fully paid-up shares as an inducement to the other shareholders to come forward and take up the forfeited shares. They were in debt, according to the last accounts, about \$500, but against that there is the bullion, which should realise between 2000, and 3000. As to the mill, an original contract was made for a 20-stamp; when Mr. Haley postponed its erection he agreed with Messrs. Booth, the contractors, that the machinery should remain upon their premises free of charge, and that they should be paid \$13,500 for the mill; Mr. Haley paid \$8000, leaving \$5500 due. When Mr. Bowe was in California he saw one of the partners of Messrs. Booth, with whom an arrangement was made, if the company so wished, to supply the complete machinery for a 10-stamp mill for \$1500 more. Therefore, it would be for the shareholders now to say whether or not that arrangement had better be adhered to. The board considered 2000, would be requisite to pay the freight and erect a 10-stamp mill, and Mr. Bowe had authorised the directors to say that those who took up the forfeited shares should have transferred fully paid-up shares in the proportion of one for every two—in other words, a bonus of 50 per cent.; there were 4000 forfeited shares, and their issue would exactly complete the capital of the company.

Mr. FORTESCUE HARRISON, M.P. (a director), said he had taken 1000 shares; the Chairman had told them the present position of the company, and it was now for the shareholders to consider whether they would assist in preventing the property falling into the hands of the creditors. They had a very valuable property on there. In addition to the quartz mine, the property comprised a valuable gravel claim. By accident they had secured a very good thing, and the directors, who are very large shareholders, are perfectly willing to take their full proportion of the forfeited shares, provided, of course, the other shareholders took theirs also. The Chairman proposed spending his holiday in America, and whatever he said upon his return might thoroughly be relied on. If, however, the shareholders did not come forward they would lose a good property—at the same time, they were in the hands of those who could like to have it.

Mr. G. BATES drew attention to the smallness of the capital account—40,000. The CHAIRMAN said the amount paid for the property was 7000, cash and 1000 stock. Out of the 4000, Mr. Haley himself took 1000, and other Americans 1000, each, so that out of 4000, three Americans had taken 3000 in shares of the company. The vendors had all been settled with, and the company possessed a clear, indefeasible title.

Mr. G. BATES reminded the proprietors the property was acquired on the report of Mr. McLean, of the Sweetland Creek, and there was no reason whatever to alter the favourable opinion then formed—that they had an exceedingly valuable property, and secured upon most advantageous terms. All the machinery required was comparatively trifling, but it was proposed to erect a 10-stamp mill, so as to apply another test to the ore.

The CHAIRMAN said that the outlay of 1000, would enable them to test the value of the gravel claim, but if the shareholders did not choose to furnish the means an attempt might be made to sell the gravel claim, although from all they could hear it would be a pity to do so.

Mr. BOWE said:—While in California I paid two visits to the Holcombe Valley property—one in the month of October and one in January last. On my first visit I found that the Mammoth Ledge had been opened by two incline shafts sunk on the vein—No. 1 incline to the depth of 106 ft., and No. 2 to the depth of 170 ft., the latter being about 50 ft. below the water-line. The 120 ft. level, driven west from incline No. 2, was then in 72 ft. At 37 ft. rich ore was struck similar to that found at 93 ft. from surface, showing that the shoot of rich pay ore most probably runs obliquely through the vein, which is very common in most of the developed quartz mines of California. I measured the vein in incline No. 2 below water level; at intervals of every 10 ft., and found the lode to average about 15 in. The rock below water level appeared to be more solid than above, but does not carry so much mineral. I think there is every reason to hope, judging from the history of other mines in California, that pay ore will come in again by our continuing to prosecute the sinking. There was no indication that I could see of the ledge pinching out. I also measured the width of the lode in both inclines and levels, as far as driven above water level, at intervals of every 10 ft., and found the average width of the vein to be 34 in. The distance between the inclines is 320 ft. The former owners had stopped out and worked the ore between these two points to the depth of 20 to 40 ft., leaving 80 to 90 ft. backs of ore ground between the old stopes and the 120 ft. level, which is pretty safe to assume is continuous from the fact that it is very nearly surrounded by inclines, levels, and stopes. This body of ore between the inclines, being 320 feet long by (say) 80 feet deep, and 2½ feet wide, should yield something like 4500 tons of ore, rich, reckoned at \$30 per ton, the estimate of Mr. Haley, would of itself justify the erection of a ten-stamp mill. This I do not think is an extraordinary assumption, judging from what I saw when I last visited the mine, and it is not to be presumed that this is all the ore in the Mammoth vein above water level, as there is 600 ft. of ledge east of incline No. 2, and about 300 ft. west of incline No. 1, which is untouched only by shallow surface workings of former owners. Besides this there is the Ohio and San Bernardino veins, the former of which has been tested to the depth of 187 ft., and the latter 110 ft., both having produced from most reliable authorities an average from \$10 to \$50 per ton, there having been several thousand tons of ore treated from

these veins by prior owners. It was thought best, seeing that the new mill could not be erected before winter, to put a five-stamp batter of the new mill machinery into the old mill, in order to show to shareholders that there was really enough mineral in the ore to justify going forward with the erection of the mill, and at the same time will help to keep down and pay the accruing expenses of the company. The two reported runs have, according to Mr. Haley's letters and telegrams, pretty well established the fact that the ore in free gold and sulphurets will average near or quite \$30 per ton, instead of \$15, upon which the property was bought. This being the case, a 10 stamp mill will realise what a 20 one would if the ore had only proven to average \$15. There had been several new discoveries in the district, one of which had been sold to San Francisco parties for a large sum; and I have no doubt that when I was there our property could have been sold in San Francisco for more than our whole capital stock, and from independent information I have no doubt but what it could be sold there now at that figure.

Mr. HARRISON said he had put his name down for 2500 of the forfeited shares, because he expected other shareholders would subscribe for their proportion.

A vote of thanks to the Chairman and directors closed the proceedings.

ANGLO-AUSTRALIAN GOLD MINING COMPANY.

An extraordinary general meeting of shareholders was held at the offices, Austinfriars, on Monday, for the purpose of passing a resolution in the form, or to the effect, following:—"That the directors be authorised to increase the capital of the company to the extent of 50000, or any less sum, by the issue of new shares, of 10s. each, payable 1s. on application, 2s. on allotment, and the balance by monthly instalments of 1s. each, any subscriber for such new shares to have the option for one year of taking at par so many of such shares for the time being unallotted as shall be proportionate to the number at first applied for by him, and that the holders of such new shares shall be entitled to the same dividend per share as though they were shares of 2l. 10s. each, and such new shares shall rank for dividends *pari passu* with the original shares of the company."

Major JELF SHARP in the chair.

The LONDON MANAGER and SECRETARY read the notice convening the meeting.

The CHAIRMAN said he had much pleasure in moving this resolution. All he need say was the directors had the most favourable opinion of the mine, and fully believed by the judicious expenditure of the capital thus proposed to be raised successful results would be realised. Of the new shares 4200 had already been agreed to be taken, although some of them under conditions, which he thought the directors would be able to comply with. He then proposed the resolution.

Mr. LAMB seconded it, and mentioned that the prospecting shaft, through which they were now working, had been paying its own expenses for the last four or five months. But it was proposed to sink other shafts, and to drive another level north, to enable them to work upon a large area of ground. One important object to be gained by the new capital would be the sinking of the engine-shaft from a depth of 382 to 400 ft., and to open out the mine, from which such results might be anticipated as to make up for all previous disappointment, and at the same time satisfy all associated with the company. He added that 5000, would enable them to sink several prospecting shafts to a depth of 70 ft., and to open out an increased area of the ground, which was now and had been for some time past paying its own expenses: 20000, would carry on the mine for 12 months, during which time most important points would be developed.

Mr. MURCHISON said the result of the proposition now before the meeting would be that the new shares—of 10s. each—would receive the same dividend as the 2l. 10s. shares. Some of the parties applied for, or had signed a memorandum to the effect that they would subscribe only if 6000 out of the 10,000 new shares were taken up. The directors thought if 5000 shares were applied for sufficient capital would be at command to successfully carry out the important objects referred to by Mr. Lamb—this would, in all probability, lead to valuable improvements and discoveries, and put the mine in a really satisfactory position. It was also proposed that those who subscribed for (say) 5000 shares should have the option for a year of claiming a similar number at par of the unissued proportion, so that in the event of discoveries being made those who assisted now might have the full advantage of the success their capital had contributed to realise.—The resolution was put and carried.

A vote of thanks to the Chairman and directors closed the proceedings.

CLIFTON SILVER MINING COMPANY.

An extraordinary general meeting of shareholders was held on Monday, at the offices, Great Winchester-street,

Mr. DAVIS in the chair.

The CHAIRMAN said the meeting was of quite an informal character, and, therefore, he would not ask the Secretary to read any notices. At their last meeting, which was held six months ago, a resolution was passed that the mine should be shut up—at all events for the present. Instructions were sent out immediately to do so, and on Jan. 2nd Mr. Sawyer (agent of the company) wrote to the directors to say that he had been in constant consultation with Mr. Ramage (one of the directors now out there), and that he had on that day actually closed the mine; but that he had agreed to lease it to a few men, on the condition that the company was to have 10 per cent. of the gross proceeds. Under that lease the company had received about \$250 only. The shareholders would also remember, he had no doubt, being told that 150 tons of ore had been sent to Mr. Colman's works to be dressed there. He (the Chairman) confessed that he had had a very high opinion of Mr. Colman's works, and that sending the company's ore there would be the salvation of the company. Just before Christmas the directors received the result of that treatment from Mr. Sawyer, and he regretted to say that the result was most unsatisfactory. The dressing had had no effect whatever on the ores, owing to their peculiarity; and there was little or no good got out of the experiment, and the expense of sending the ore to the works and charges for the treatment were lost to the company. During the first three months of this year the directors had received periodical letters from Mr. Sawyer, in one of which he had agreed to close up his agency, and merely to look after the general affairs of the company. They had also received one or two letters from Mr. Ramage. But, on March 28, the directors wrote a very long letter to Mr. Sawyer, asking him the advisability of resuming mining operations, and also as to whether there was any probability of a market for the ores there. On May 11 an answer to this letter was received from Mr. Sawyer, dated April 21, which he would ask the secretary to read.

Mr. ANDERSON then read the following extract:—"Mr. Sawyer says that the company resuming mining operations soon, it is rather difficult for me to advise, but would offer the following suggestion. 'If we had a cash market for our lead ores, or if you are in a position to know that there will soon be a company formed in England for the purpose of purchasing and smelting lead ores in this vicinity, I would by all means advise the company to commence work at once.'"

The CHAIRMAN then said that all the rest of the letter speaks of what he would do, and finished by saying that if the directors decided not to commence work on the mine at present, but to shut it up, he could lease the mine for one or two years, the lessees giving the company 10 per cent. of the gross proceeds, and that they would employ men to work it. The present lease was merely a verbal one, as Mr. Sawyer did not know whether the arrangement would be considered a satisfactory one by the shareholders. What work the lessees have done had not been done so well as it might be, but the mine was not in a bad condition. Mr. Sawyer then advised that the mine should be allowed to lie idle, rather than that it should be leased to persons over whom the directors would have little or no control. Before answering that letter the directors unanimously came to the conclusion that the shareholders should be called together and consulted with as to what really should be done with the mine. He (the Chairman) could only say that Mr. Sawyer had always been found most straightforward and trustworthy since he had been there, and he did not think they could follow anyone's advice better than his; but if any shareholder had any suggestions to make to the directors they would be most happy to listen to them.

Mr. COLVIX: Have you any balance in hand now?—The CHAIRMAN: We have very little; I think about 2500.

Mr. COLVIX: Who pays Mr. Sawyer now?—The CHAIRMAN: We have closed our agency with him. He is merely looking after the mine, and after the 30th of this month we shall have no expense. Since convening the meeting we have had two letters from Mr. Sawyer, in one of which he says that the suits instituted by Messrs. Richardson and McCree—which, I dare say, you recollect I spoke about at the last meeting—have not been called in at the Court, and the Court would rise in a few days—so I think there is an end to these matters. He also stated that he had received an offer for the ore from Mr. Bertoline.

A SHAREHOLDER asked if Mr. McCree was at the property now?—The CHAIRMAN replied that he did not know where Mr. McCree was at all. He did not believe he was anywhere near there.

The CHAIRMAN, continuing, said there was also a rather important letter from Mr. Ramage, which it would be well that the shareholders should hear, in which he states that he had sent over the samples of ore which were now exhibited.

The SECRETARY then read a letter, dated Jan. 17, from Mr. Ramage, which can be seen at the company's office.

The CHAIRMAN said he would add to that letter that samples of these specimens had been analysed, and the result was that the average amount of silver was only 38 ozs. to 1 ton of ore, with 58½ per cent. of lead. This result was, as the shareholders might imagine, very disappointing to the directors; for the fact was that it would not pay to ship such ore to this country at all. A Mr. Hill last winter resolved to erect lead smelting works, which, no doubt, would have been of enormous benefit to the company; but, unfortunately, the monetary panic set in, and Mr. Hill did not carry out his project. There could be no doubt that the mine possessed by the company was a good one, and that there was an immense quantity of ore there, but they could not sell it, for there was no market out there. He would be happy to answer any questions which might be put.

Mr. COLVIX asked if the Chairman could explain how the money had been spent, and if it had been spent in unprofitable work?—The CHAIRMAN said he explained at the last meeting the exact state of the finances, when they were left with only a little more money than they now have.

Captain KIRK (a director) thought the great mistake they had all gone into was in calling it a silver mine, for it was in reality a lead mine. The shareholders would have observed from the analyses the preponderance of lead, and they would see in both cases that lead predominates there largely. If they in the mine in this country he thought the directors of the company would be in a very different position, because the shareholders would congratulate themselves on having such a valuable property, but being where it is—18 miles from a railway station, and

he did not know how many thousand miles from a port—the charges were so heavy that it would not pay the company to export ores to this country, and there was no market for it there. Until some smelting or concentration works were erected it. This was his own opinion, and it was shared by his co-directors; and also by Mr. Sawyer and Mr. Ramage. They had no money, and no cash market for their ores, and, therefore, he was of opinion that it would be better to leave for their own country, and do nothing; and it was this course which the directors recommended the shareholders to adopt. If a railway were brought nearer, or if someone started smelting-works, he had no doubt the company would be a successful one. There had been some talk about concentration purposes; but the result of Colonel's process was sent; but, on very good authority, the directors were informed that a very much larger quantity should have been sent, and that 150 tons was a ridiculous amount to send, as it would not feed the machine more than once. At this distance from the mine, and hearing the opinions of one and another, it was perfectly impossible to know what to do, and for the present he thought the best thing would be to do nothing.

Mr. BRADLEY asked if the mine was perfectly unsaleable now?—Capt. Kirk thought, after the result of this money having been spent with no return, and that there were any amount of mines in the district in the same position, that it would be difficult to find a purchaser until some good concentrating process was provided, or smelting works erected in the neighbourhood.

Mr. COLVIX asked how it was that the mine was brought into the market as a silver mine, as it appears to be a lead mine?—Capt. Kirk said it was a silver mine as well as a lead mine, but it was not expected that there would have been such a preponderance of lead. He then quoted the different prices that have been paid for ore had been sold, the net receipts amounting to \$493 70c. for the same quantity of ore as that exhibited in the room.

The CHAIRMAN said he thought it would be to the advantage of the shareholders at once to close the lease altogether, and shut up the mine for the present, and when the shareholders were again called together he hoped there would be something of a more cheering character to tell them.

A SHAREHOLDER asked how it was that at the last meeting there was 5000 in hand, and now there was only about 2500?

The CHAIRMAN explained that at the last meeting it was decided that 2500 should be sent out to the mine. This was done, and 1000 was sent to defend the suits instituted against the company by Richardson and McCree. There was also Mr. Sawyer's salary out of that sum.

Mr. COLVIX supported the recommendation of the directors, and a general opinion was expressed in favour of it.

The CHAIRMAN stated that the shareholders would be called together, as usual, in November for the ordinary meeting, and in the meanwhile the directors would carry out the wishes of the shareholders, and investigate everything that was going on.—The meeting then concluded.

WEST TANKERVILLE MINING COMPANY.

An extraordinary general meeting of shareholders was held at the offices, Austinfriars, on Tuesday, for the purpose of considering, and, if thought advisable, of passing the following special resolution:—"That in the event of the divisible profits of the company in any year or years being insufficient for the payment of the preferential dividend of 15 per cent. per annum on the 3000 shares authorised to be issued by the special resolutions of the firm on May 5, 1874, the profits of any succeeding year or years shall be applicable to the payment of the arrears of dividend of any preceding year or years."

Mr. J. J. PYNE in the chair.

The LONDON MANAGER read the notice convening the meeting. The directors explained that, being desirous to meet the views of the shareholders generally, they have, owing to representations received from some of the largest holders, decided to recommend that the 15 per cent. preference dividend shall be cumulative from the date of issue of the preference shares, payable out of profits. At present the directors and nearly all the large shareholders have applied for their proportion of the preference shares, and more than one-half have been subscribed for; and the directors have reason to believe that, if this course is carried out, probably the whole number will be taken, which would be of great advantage to all concerned. Of course, the members of the company who have already applied for shares will participate in the proposed amended terms, if adopted, and it is hoped they will be induced to increase their interests.

The CHAIRMAN said that since he last addressed the shareholders 1595 of the new shares had been allotted, and 200 more had been taken, with this reservation—that, in the one case, 2000 shares should be taken up; and, in the other case, that the resolution embodied in the notice convening should be passed. But the main object the directors had in view in proposing this resolution was that the whole of the shares might be applied for. The directors were most desirous the whole should be taken up, for when it was determined to recommend an increase of capital it was decided not to ask for more than sufficient to carry on the work efficiently. Several shareholders had been in communication with the directors, and their desire was that the dividends should be cumulative. The directors had taken the matter into consideration, and now submitted the resolution for the adoption of the meeting. The effect would obviously be to make these new shares more desirable. Upon the shares already allotted instructions have been forwarded to Capt. Waters to push down the shaft with all possible speed—a point of vital importance in the successful opening out of the mine, and Capt. Waters had made a contract to sink the shaft to the 65. He then proposed the resolution embraced in the notice convening the meeting.—Mr. HILL seconded the proposition.

Mr. MURCHISON said the holders of the preference shares had the important option of converting them into ordinary shares. Supposing the mine turned out to be equal to Roman Gravel, the privilege of such an option would be valuable. A shareholder who had just visited the mine informed him (Mr. Murchison) that the lode in Roman Gravel, close up to West Tankerville boundary, is now worth more than 7 tons of ore per fathom.—The resolution was put and carried unanimously.

A vote of thanks to the Chairman closed the proceedings.

NEW PEMBROKE MINING COMPANY.

At a general meeting of adventurers, held at the account-house, on June 9 (Mr. R. T. HEAD in the chair), the accounts for 16 weeks, to March 28, showed a debit balance of 1115/4s. 9d. The report of the agents was adopted, with the exception of that part referring to the western portion of the mine; the further working of the western, or Edgumbe's, part of the New Pembroke Mine is to be discontinued, and the pitwork and material sold, unless such western portion of the mine can be sold as a going concern within a month from this time on terms more advantageous than the taking up and selling the pitwork and materials; and Dr. Treffry, Mr. West, Mr. Polkinghorne, and Mr. Remry were appointed a committee to negotiate and arrange with any person for selling it, with full powers to act. A call of 2s. per share was made; and the best thanks of the meeting were tendered to Mr. Jonathan Boddie for his liberality, on the application of the company, in suspending the dues and minimum rent until he is satisfied that the returns are such as to justify a resumption. The following report was read to the meeting:—

June 9.—We have much pleasure in reporting to you on the present occasion, inasmuch as since the last general meeting of shareholders, held on February 17 last, we have had a good improvement in copper in the eastern part of the mine, and it will also be observed from our present report that our prospects are much more encouraging for a good improvement in tin at the 110, which is our present bottom level. The sinking of the engine-shaft below the 110 fm. level, at 300, per fathom, to cut the shaft 14 feet long. At the 110 fm. level we have driven east of the shaft about 30 fathoms, and for the whole of that driving the lode has been very small and unproductive, but not being satisfied that we had the main part of the lode, we considered it advisable to put up a rise from the back of the level to further prove the lode and for ventilation; and by so doing we have communicated with the 100 fm. level. At that point we discovered that the main part of the lode was gone down north of the rise, and we, therefore, cut into the lode from the rise, about 5 fathoms below the 100 fm. level, where we find the lode to be full 5 ft. wide, composed of beautiful soft peach, producing some good work for tin, worth 12½ per fathom, and promising to open out good ground for stopes. In consequence of the above discovery, we have commenced driving a cross-cut north from the present end at the 110 fm. level, and expect to meet the same lode in about 2½ fms. driving. The north lode at the 110 is still kindly, but unproductive for mineral. In the 100 fm. level, east of the shaft, the lode in the end is at present disordered, and producing low-quality tin stuff, but letting out water more freely. In the bottom of the 100 fm. level, east of the shaft, we have sunk a winze at the 5 ft. below the level, which is as deep as we can sink for water. The lode in the winze is 3 ft. wide, and worth 18½ per fathom. We have five stopes working in the back of the 100 fm. level. In No. 1 stope, east of shaft, the lode is 3 ft. wide, and worth 10½ per fathom. In No. 2 stope the lode and branches, for 10 ft., are worth 28½ per fathom. In No. 3 stope the lode is 5 ft. wide, and worth 25 per fathom. In No. 4 stope the lode is 4 ft. wide, and worth 17½ per fathom. In No. 5 stope, on the north part of the lode, the lode and branches, for 10 ft., are worth 32½. In the stope in the back of 90 fm. level, east of the winze, the lode is 7 ft. wide, worth 28½ per fm. In the stope further east the lode is 5 ft. wide, and worth 10½ per fathom. In the stope in the back of the 60 fm. level, on the south side, the lode is 4 feet wide, and worth 10½ per fathom. The average price for stopping the lode throughout the mine is 2½ 16s. per fathom. The lode in the present end, driving east of the shaft, is about 2 ft. wide, but still unproductive for mineral. This end is now about under the winze sinking below the 75 fm. level, and is being forced on as fast as possible by six men, and hope soon to reach the base of the copper gone down below the 75. The lode in the winze sinking below the 75 fm. level, east of the engine-shaft, is still further improved since our last monthly report, and is now 6 ft. wide, worth full 100½ per fathom, and presenting good prospects for its continuance.

In driving the 75 cross-cut north, east of engine-shaft, on the cross course, we have intersected a promising lode about 1½ ft. wide, yielding stones of strong yellow copper ore. We have commenced driving both east and west on the course of the lode, which is discharging a large stream of water, and by driving beyond the influence of the cross-course we may very reasonably expect a good improvement in mineral; it may be well to observe that this lode is standing entire in unexplored ground from the bottom of the mine to surface. In the western, or Edgumbe's part of the mine, since the last general meeting of the shareholders, the principal operations have been confined to the clearing and securing the 121 fm. level from Edgumbe's shaft, on the north and south lodes, referred to in former reports. On the north or main copper lode we have cleared and secured the 181 fm. level to the present end, and find that level has been extremely, a productive cross-cut about 58 fms. The former workers had been, apparently, a productive lode for copper, as all the lode from the back and bottom of the level has been taken away for upwards of 30 fms. in length. We found the ground badly eroded, and the level choked with quite full of stuff. Beyond the ground worked away the lode is from 2 to 3 ft. wide, but at present poor for mineral. The same level is

M. PIERRE VIGOUROUX, of Paris, civil engineer, has patented improvements in the manufacture of certain bituminous materials. This composition is prepared by mixing together and heating about 45 parts of coal tar, 45 parts of Nile alluvium, or any analogous matter, and 5 parts of hydrochloric acid.

NEW FINANCIAL PROJECT—THE ROCKY MOUNTAIN MINERAL CONCENTRATION COMPANY.

An enterprise of great local importance has recently been incorporated under the laws of Colorado, and from the peculiarity of its constitution is worthy of consideration. The object is to secure a full return of the investment out of ores subscribed by the mine owners for the purpose of procuring the funds for the erection of a concentration establishment. Thus the capital subscribed is paid back out of the first ore treated (that given by the mine owners) yet the subscribers retain their shares nevertheless, and participate in future profits. Apart from the importance of the enterprise for the miners of Colorado, the features of its financial arrangement are so novel that they will interest investors and financial operators generally. Hitherto the entire produce of fine metal in the Territory of Colorado (\$5,000,000 in 1873) has been obtained either from "first-class ore," which is ore rich enough in itself to permit of its being shipped to Chicago, Illinois; Newark, New Jersey; Swansea, South Wales; or Freiberg, Germany; or from such ores as can be treated by direct amalgamation. All over the Territory, with one or two exceptions, the "second-class ore," which includes all carrying less than 40 ozs. of silver per ton of crude ore, and "refractory ore," or that which cannot be treated by direct amalgamation, are thrown over the dump and totally neglected.

It is upon these facts that the financial project in question is based. The Rocky Mountain Mineral Concentration Company proposes to erect works for concentration, smelting, and refining in those districts in which the mine owners subscribe sufficient ore, worth above \$15 per ton, to pay for the erection of the works required to turn the low-grade ores into reduced ores, or bullion high enough in assay value to allow transportation to market. When the cash invested in the works has been completely returned by the subscribers ore being turned into cash, the cash investors remain the proprietors of one-half of the shares, the full fair value of their investment, and the mine owners remain proprietors of the other half, thus uniting their interests, so as to guarantee the future profitable operation, promising about 50 per cent. per annum, and without direct mining risk.

To carry out these objects the bye-laws of the company provide that the certificate of stock will be numbered and registered as they are issued, signed by the president and countersigned by the secretary. Transfers of stock will only be made on the books of the company, and the possession of stock will not be regarded as ownership unless it appears upon the stock books of the company that said certificate was issued or duly transferred to the holder. The capital stock is divided into two classes, consisting of \$50,000 each; one class is cash stock, and the other premium stock. Subscribers to cash stock are entitled on paying up for the same to an equal amount of premium stock gratis. No greater amount of premium stock can issue than there is cash stock subscribed and paid. Premium stock may be subscribed to by miners owning ores situated in the county where the company's works are located, and may be paid for in ores representing a cash value of not less than \$15 a ton, on such calls and conditions as may be prescribed by the trustees. Ore so paid in will be converted into cash, and the same paid over to holders of cash stock on the order of subscription in payment at par of the premium stock, which will immediately be assigned by the holders and transferred to the subscribers on the books of the company. All stock, whether cash or premium, will share equally in the government of the corporation, and participate in its dividends. Works will not be constructed by the company, and the money paid in on cash stock is to be returned to the subscribers, unless premium stock equal in amount to the cash stock subscribed for and paid shall have been sold to miners capable of supplying to the works in the aggregate at least 100 tons of ore per day of the value stated.

The company has its office in Denver City, Colorado, and among the trustees are Prof. Schirmer, superintendent of the United States Mint in that city; Mr. F. D. Hager, of Hager, Sons, and Co., bankers, Denver; and Mr. J. M. Paul, the president of the Miners' Association of Colorado, and who, it is expected, will be the next Governor of the Territory; whilst the secretaryship and management of the technical department will be in the hands of Mr. Francis Cazin, M.E., C.E., whose inventions in the mineral concentration line are based on a large experience and special knowledge. The progress of the company will be carefully recorded.

NOVA SCOTIAN GOLD DEPOSITS—No. IV.

The district of WAVERLEY, from its proximity to Halifax, the metropolis of Nova Scotia, as well as from the fact that a single mine there produced in one month a bar of 1200 ozs. in weight, has been looked upon abroad as the representative district of the Province, although its gross yield has been exceeded by Sherbrooke, where the works have been conducted more perseveringly and systematically. We take, however, the following description of the district from an elaborate report prepared by Prof. H. Y. HIND, in 1868, under instructions from the Hon. ROBERT ROBERTSON, the then Commissioner of Public Works and Mines:—

"GEOGRAPHICAL FEATURES.—Waverley Gold District is 14 miles from Halifax, 11 of which are by rail to Rocky Lake Station, and 3 from the station to the village, situated in the centre of the district. The western boundary of the area shown on the plan is, however, not more than 1½ mile from Windsor Junction Station, 13 miles from Halifax. Two well-marked chains of lakes traverse the district from north to south. These lakes lie on the course of two nearly parallel dislocations, or lines of disturbance, about 5000 ft. apart, and offer a fine illustration of the dependence of geographical outline on geological structure. The westerly chain embraces Third Lake, Three Mile Lake, and Fishing Lake, with their connecting streams, in the aggregate 2½ miles long. Their waters flow from north to south, to the vicinity of Fishing Lake, they then strike across the country to Lake William, which, with a large sheet of water, named Lake Thomas, belongs to the eastern chain, whose waters flow from south to north, and ultimately reach the Bay of Fundy by the Shubenacadie River. The eastern shores of Lakes Thomas and William are bold and abrupt, having a mean altitude of 200 ft. above their surface, and when viewed in connection with the low country occupied by the lakes named, at once suggest to the observer a disturbance of considerable magnitude in geological structure. The district is divided into two portions, called East and West Waverley. East Waverley lies to the east of Lakes William and Thomas; West Waverley to the west of those lakes. No surface within the limits of the district is elevated more than 330 feet above Lake William, or about 380 feet above the sea. The highest point is on the north boundary of East Waverley. The summit in West Waverley is on the outcrop of the Union or Taylor lead, and is 116 feet above Lake William. On a line of section running nearly due east and west along the axis of the anticlinal, in West Waverley, the highest point is 98 feet, while east of Lake Thomas, on the continuation of the same section, the land rises abruptly to 200 feet above the lake.

"GEOLOGICAL FEATURES.—In West Waverley there are few rock exposures—coarse drift varying from 3 ft. to 50 ft. in depth, and in great part composed of gravels and clays, enclosing unworkable masses of local origin covers the surface. A few boulders of granite, derived from a range some miles to the north, are scattered here and there. In East Waverley rock exposures are numerous, and in general the drift is shallow; it contains comparatively few detrital masses until the summit plateau is attained near and beyond Lake Willis. The strata at Waverley are arranged in the form of an elongated elliptical dome, whose longest axis is from east to west, or more correctly on a course N. 85° E. The first movement which led to the present attitude of the strata was from south to north, by which the beds were thrown into a large anticlinal fold or undulation, one of many parallel and similar undulations which traverse the country. A very feeble conception can now be formed by superficial observation of the original enormous magnitude of these huge waves of rock which ridged the surface of the province. Whether denudation took place as fast as the uplift, or whether the undulations obtained their maximum altitude, partially or wholly undened, it is certain that not less than 9000 ft. in vertical thickness, belonging to one rock series,

have been removed from the present surface of Waverley gold district. The direction of the crest or axis of this undulation is from east to west, and the force which occasioned it operated sufficiently long to throw it over towards the north, hence on the south side of the anticlinal the dips are much less than on the north side, and at the depth of 400 or 500 ft. the strata on the north side of the anticlinal will have an overturn dip, and a vertical section from north to south would show the beds to have been thrust over in the form of a pot-hook, or letter S. Long subsequently to the operation of the force which occasioned the east and west anticlinal, another movement from west to east produced a low north and south anticlinal, whose axis appears to lie near Lake Willis. It is this movement which has been the cause of the enormous breaks or dislocations already alluded to as affecting the geographical outline of the country. The result of these anticlinals crossing one another nearly at right angles is seen in the long elliptical dome-shaped form, tilted over to the north, which the strata at Waverley now exhibit."

BRITISH ENTERPRISE IN COSTA RICA.

It will be recollected that some time since a company was formed under favourable auspices to acquire a mining property in Costa Rica, represented to be of great value to those offering it for sale in this country, and that the intending purchasers, upon the recommendation of Mr. David Forbes, F.R.S., Dr. Percy, and Messrs. John Taylor and Sons, appointed Mr. W. B. Richardson, a former pupil of the Royal School of Mines, to examine the property. His report appeared too good to be true, but he considered it unjustifiable to tone it down. In course of time, however, doubts arose whether Mr. Richardson had had sufficient practical experience to enable him to estimate safely the quantities of ore which could be raised under given circumstances, and the profits which would result from them. Capt. H. Clemes, of Falmouth, a well-known mining authority, was then sent out, and his report on the mines was by no means satisfactory. The quantity of water was such as to preclude, even with a glass lantern, his ascending some of the rises communicating with the upper galleries; but so far as he could proceed the whole of the levels nearly presented a very contracted and crushed appearance, and at their entrance from the surface nearly all the timber has succumbed by decay and pressure to the heavy surrounding decomposing matter. Captain Clemes concluded by expressing his opinion that "the mines did not offer sufficient inducement to merit the attention and outlay asked for them, and in arriving at that conviction he did so from practical observation, however much he was thus obliged to differ from the expectations of those gentlemen who had previously reported on the property." This altogether blighted the hopes of the vendors, who had, moreover, paid Capt. Clemes's fee for the report. Mr. Richardson refused to attempt to refute Capt. Clemes's report, and the result was that the directors concluded that Mr. Richardson had undertaken a duty for which he was not, perhaps, quite competent.

But whilst reporting so very unfavourably upon the Trinidad mines, Capt. Clemes reported very favourably upon some mines he saw on his way to the Trinidad mines, and the vendors proposed to substitute one set of mines for the other. Captain Clemes recommended the purchase of the Sacra Familia property, not only because it was a good thing, but because the terms of purchase are moderate. The terms of purchase were to include an outlay altogether of something like 65,000*l.*, and the profits promised from the outlay are very large. Moreover, the mines are fully developed. Over 7000*l.* has been expended on the machinery, which is ready to work now almost immediately, and the only circumstances under which this property could be obtained at anything like the price at which it is now offered is that it belongs chiefly to a gentleman who is sent over here as the financial envoy of the Costa Rica State, connected with the business of the Costa Rica loan. Under these circumstances, there was an opportunity of acquiring the property upon favourable terms for 65,000*l.*, and it was determined that Captain Clemes's report should be printed, that the shareholders might be able to judge whether the purchase was worth making. This has now been done, and the directors have succeeded in effecting a contract for the purchase of the Sacra Familia and San Francisco Gold and Silver Mines, situate in the Aguacate Mountains, in Costa Rica, upon terms which they consider to be exceptionally favourable, and which they can without hesitation recommend to the acceptance of the shareholders. The reports of Capt. Henry Clemes and of Mr. Hugo Reck upon the mines in question are highly favourable, and, having regard to the reputation for prudence and caution possessed by the former of these gentlemen, the directors have confidence in adopting and acting upon his recommendations. The directors call attention to the fact that the proprietors of the Sacra Familia Mines evince their own confidence in the property by accepting a small amount of cash in respect of the purchase-money, notwithstanding the large expenditure already made upon the mines, and Mr. Allpress, one of the vendors, will join the board, his long residence in Costa Rica, his intimate acquaintance with the language and customs of the country, and the large interest he has in the mines, making his connection with the management an important matter.

The first attempt at mining in Costa Rica in search of gold and silver is said to have been recommenced early in the present century, but owing to the employment of inexperienced people, defective modes of working, and very limited funds, but few of the mining enterprises resulted profitably. Capt. Clemes reports that the Sacra Familia extend about 2000 yards in length, by 100 yards in width. They are held under a grant from the Government, free of all charges, with the right of cutting all necessary timbers for building and mining purposes, and of transferring or selling the grant. They are situated in a high mountainous section, at an elevation of 2540 feet, thickly covered with wood, excepting the clearings around the buildings and works. It is in the narrow defiles and steep declivities sloping westerly that six adits or levels have been driven, and these constitute the mine, which possesses, by its elevated position, great facilities for development in a most economical and expeditious manner, inasmuch as all the drainage can be effected by adits, and the transit of ores from the levels to the reduction works can be accomplished by either wire-rope way or balanced incline.

There are two lodes close to each other in parallel directions about N.E. The principal produce of the most northerly is silver ore, which, from its characteristic of being blended with a greater moiety of the base metals, obtains the name of the Silver Lode. The more southerly lode produces gold. These lodes not unfrequently unite, resulting in an increase of the base and precious metals. In many places their intersections occur very obliquely, but at others abruptly; in both instances the junctions swell the lodey mass to double its previous dimensions, and often more. Both of these lodes contain a very large quantity of profitable ores, and when thoroughly opened out the metallic wealth could be extracted at a very small expense per fathom. Reviewing the spacious and well-defined character of the lodes revealed in the respective levels collectively, there is the most assuring evidence of their containing very large quantities of remunerative ores in gold and silver, and that by further extensions their quantity will, in all probability, be enormously increased.

The reduction works consist of a substantially built wood frame-house, with stone masonry foundations for the machinery. Contained within this, and covering the whole, are the following:—10 revolving head-stamp mill about 7 cwt. per head, 1 Blake's stone-breaker 6 ft. by 12 ft. with revolving horizontal table attached, 2 German shaking tables, 3 jiggling machines, 2 conical grinding mills worked by under levelled gear, 1 centrifugal pump, and other minor connections. The whole of these appliances are intended to be propelled by an 18-in. improved turbine-wheel, with 40 metres full of water, computed to represent about 30-horse power. It is affirmed that a full supply of water to drive the enumerated machinery exists during eight months in the year, and the remaining four months sufficient for about half-power. The cost incurred in the machinery, including watercourse and iron piping conducting water to the turbine, a cart-road, and wire transit incline conveying the ores to the mill, has been estimated at 7500*l.*, and an expenditure of 16,000*l.* was incurred in opening up and developing the mines.

The water supply is very accurately described by Capt. Clemes as

a momentous question, and suggests that the quantity of this element should be most carefully estimated in the dry season, and that if it be practicable with a moderate outlay a reservoir should be made to collect the water during the period of the rains. Second in importance to this is the native labour, which at present is limited, but the staff could be increased to a full complement, he was informed, by the importation of Chinese labourers from California and the latter country could be obtained, and being long accustomed to mining pursuits, as well as the climate, their services would be valuable. In addition to the staff of native labourers, a limited staff of European skilled labourers to attend to the most important branches of the mine, and of mechanics to keep the machinery and tools in order, would be indispensable. Of these two questions sufficiency of water is the greater, as he is favourably impressed that, with judicious management, after a time there would be a full supply of labourers from the natives.

Capt. Clemes's report is, to a great extent, based upon that of Mr. Hugo Reck, of Clausthal, made a few years since, and fully referred to in the *Mining Journal* at the time, and it cannot be doubted that Mr. Reck's report was a very exhaustive one, calculated greatly to facilitate a subsequent inspection, so that it may be considered that Capt. Clemes had an exceptional opportunity for arriving at an accurate conclusion. It will, therefore, be the more gratifying to the shareholders to learn that in closing his report he states that, reviewing all the circumstances connected with these mines, and having regard to the reservations which he has made as to the continuous supply of water, he has no hesitation in expressing his high opinion of their value, and can conscientiously recommend their purchase.

FOREIGN MINING AND METALLURGY.

Business in copper has been quiet at Paris, but quotations have been firmly maintained, and have even been tending upwards. Chilean in bars, delivered at Havre, has made 82*l.*; ditto ordinary descriptions, 80*l.*; ditto in ingots, 86*l.*; and pure Corocoro minerals, 83*l.* per ton. Spanish copper has been quoted at about 82*l.* per ton at Marseilles. Business in copper has been very quiet in Germany, although some transactions have been noted for local consumption; prices have been uncertain and irregular. A report from M. Edouard Sève, Consul-General of Belgium at Valparaiso, states that the exports of copper from Chili, which stood in 1872 at 1,000,286 quintals, decreased in 1873 to 907,385 quintals. The exports of copper from Bolivia increased, however, to the extent of 1367 quintals last year, as compared with 1872. The exports of Chilean and Bolivian copper to England last year amounted to 850,550 quintals, as compared with 844,601 quintals in 1872. The exports to France declined, however, to 45,627 quintals, as compared with 105,667 quintals in 1872. The Paris tin market has been well maintained. Banca, delivered at Havre or Paris, has made 108*l.*; Straits, 104*l.*; and English, delivered at Havre or Rouen, 104*l.* per ton. Tin has continued to advance at Rotterdam. Banca has risen from 60*l.* to 62*l.*, and even 62½*l.*. The demand has continued good, and some heavy purchases are anticipated. Some rather important transactions have also taken place in Billiton at 57*l.* to 57½*l.*, and at the last dates there were no sellers below 58*l.*. The German tin markets have been generally well supported. Lead has been hardening at Paris, and a quotation of 21½*l.* 4s. per ton has been generally accepted. The German lead markets have also ruled firm. Silesian zinc, delivered at Havre, has brought 23½*l.* 8s. per ton at Paris; other good marks, delivered at Havre or Paris, have made 23*l.* per ton. At Marseilles, quotations have not changed to any material extent. Zinc has been well maintained in Germany.

The French iron trade still remains depressed, orders are scarce, prices are to some extent nominal, and the production is restricted from day to day. The prolonged existence of strikes in England is inducing hopes among the owners of French blast-furnaces of an early improvement in the prices of pig, the quotations for which have, indeed, been sensibly hardening. In the Ardennes iron has ranged between 8*l.* 8s. and 8*l.* 16s. per ton; in the Meurthe-et-Moselle pig has been dealt in at an average of 3*l.* 0s. 10*l.* per ton. It is not without interest in dealing with the French iron trade to note the fact that a tramway 2½ miles in length has been inaugurated at Lille; a system of horse tramways has also been decreed at Versailles.

Politics have engaged more attention than business at Brussels this week; and although the Brussels Metal Bourse has brought many people together, transactions upon it have exhibited some languor. The general feeling appears, however, to point to the commencement of a revival in business, which has been sufficient to maintain prices with firmness. The various Belgian railways have been doing more business recently for the Belgian metallurgical interest. Stocks of Luxembourg pig, although reduced, are still very important; prices remain at 2*l.* 16s. per ton. Business in pig with England has become almost nil, and the English market is so affected by strikes that it may be said to have ceased to regulate the Belgian iron trade. Authority has been given to M. Marchot to establish a rolling-mill with plates in the Commune of Tilff, in the Valley of the Ourthe; this establishment will be equipped on the Lauth and Deby differential system. The Thy-le-Château Blast-Furnaces and Forges Company will pay, July 1, a dividend at the rate of 20 per cent. per annum for 1873. The Sambre and Meuse Mines and Ironworks Company will pay, July 1, a dividend at the rate of 12s. per share for 1873.

An adjudication for 17,500 tons of coal for the Administration of Public Assistance of the Seine has taken place this week at Paris. The contract for some descriptions went into the Pas-de-Calais. The tenders were not very numerous—three in all. The result of the adjudication was to indicate a reaction in prices less decided than in Belgium. There is, however, no more mention of a fall in prices, and firmness in quotations is the order of the day both at Lille and in the Pas-de-Calais; at the same time the least serious advance might also involve serious difficulties. The continual strikes in England are watched with some interest by French coalowners, who discuss among themselves their probable effect upon their own interests.

The anticipations expressed last week with respect to the Belgian coal trade have been fully realised, and a recent adjudication shows a decided reaction in affairs, prices being supported with firmness. At Liège quotations have even been tending upwards. Both the Charleroi and Liège basins may be said to have returned, after some more or less sharp oscillations, to the prices of February, from which there is no disposition to recede. The fall in quotations has been definitely checked, and an advance will be possible if the demand increases. At the adjudication to which reference has just been made English (Newcastle) coal was offered *inter alia*. The Arsimont Colliery Company at Auvellais realised last year a net profit of 8687*l.*. Of this amount, however, only 3333*l.* was applied to the payment of a dividend, at the rate of 8s. per share; the balance was devoted to sundry redemptions and reserves. The Herve Wergifosse Company will pay on July 1 a dividend for 1873 at the rate of 3*l.* per share. The shares of several Belgian colliery companies have been tending upwards. Thus Produits au Flénu have risen from 240*l.* to 280*l.*; Hornu and Wasmes, from 120*l.* to 144*l.*; and Levant du Flénu from 230*l.* to 251*l.*

Concessions of mineral bearings have just been granted by the Government of the Grand Duchy of Luxembourg to M.M. Metz and Co., M.M. Charles and Jules Collart, the Luxembourg Blast-Furnaces Company (Esch-sur-Alzette), the Rumelange Blast-Furnaces Company, and M.M. Gonner, Munier, Helsen, and Co. The rent to be paid is 5200*l.* per annum, and this rent is to be divided among the concessionaires in proportion to the extent of their concession.

NEW FETTLING.—Messrs. WALL and PENN, of Deepfield, Staffordshire, have patented an invention, which consists of a fettling made of the mineral known as new mine rock, the said rock being first calcined, next reduced to powder, and finally mixed with sufficient water to give it the consistency of putty. It is then ready to be applied to the bed, sides, and bridge of the furnace, either alone or after the furnace bed, sides, and bridge have been lined with scrap cinder or with scrap cinder and calcined tap cinder, or bull-dog, or with new or uncalcined new mine rock.



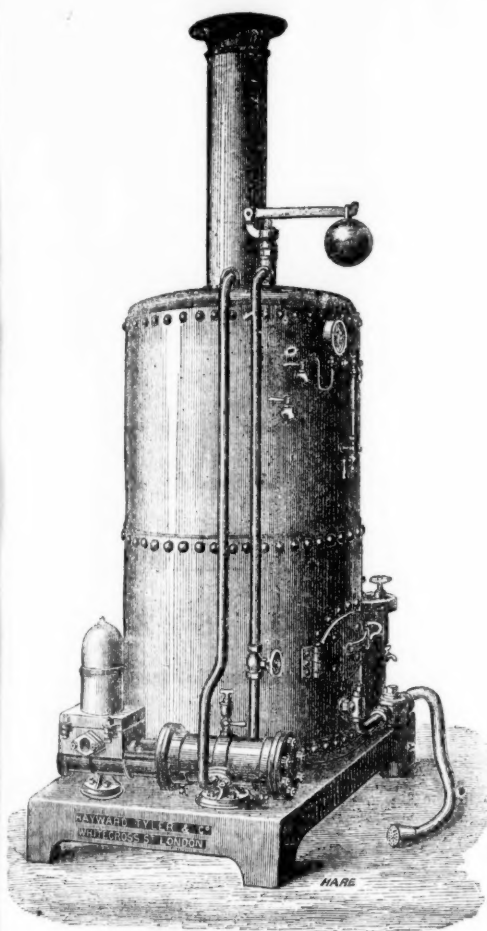
HAYWARD TYLER & CO.,

ENGINEERS,



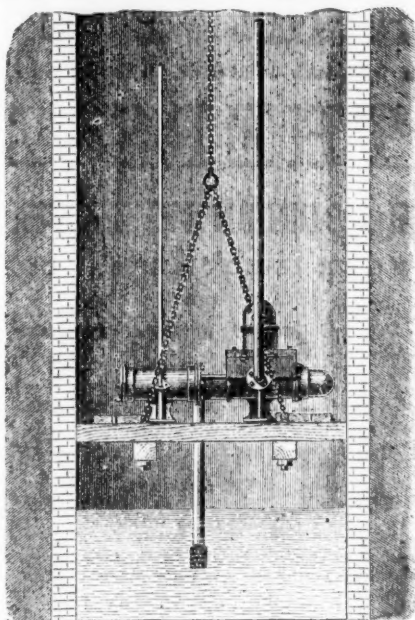
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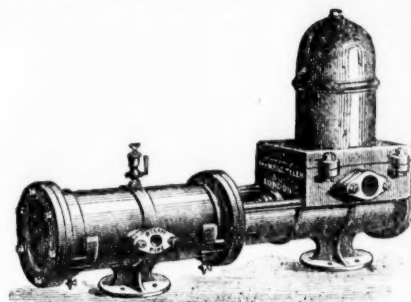
"Important to buyers of this Steam Pump is a specimen of one of the steam valves, shown after working for more than two years. It is without any wear, without even a scratch, and the marks of the tool can be seen."—*Engineer*, Dec. 13, 1872.



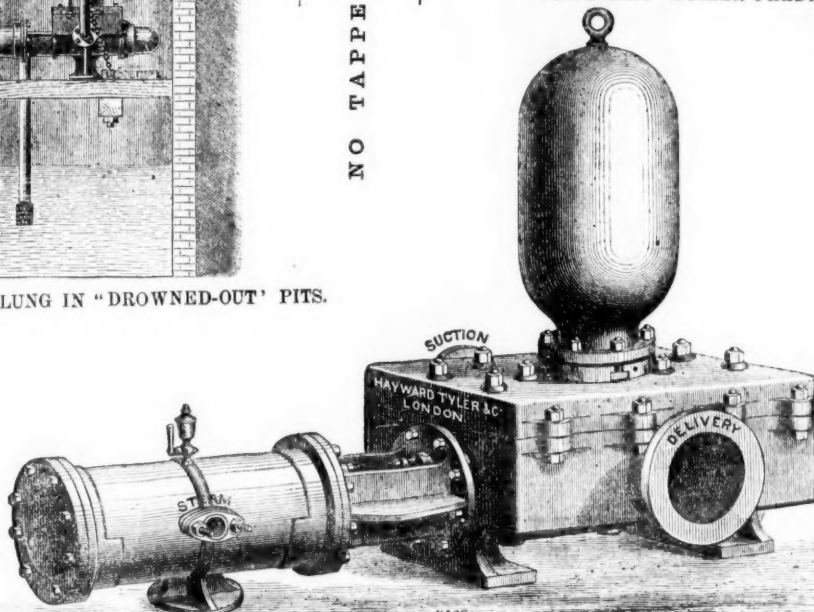
SHOWING THE "UNIVERSAL" SLUNG IN "DROWNED-OUT" PITS.

"It is a fact that, although there are a variety of Direct-acting Steam Pumps in the Exhibition, none that we have noticed works so quietly."—*Engineer*, Aug. 1, 1873.

NO TAPPET VALVES.

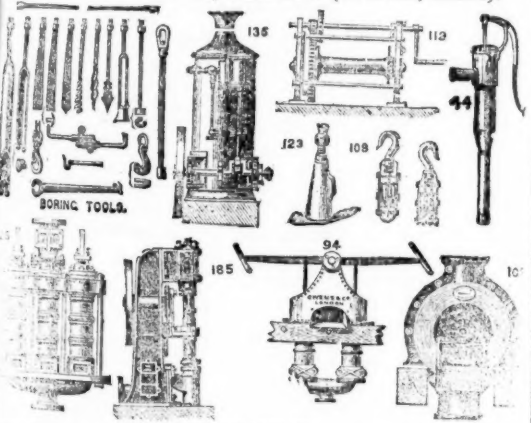


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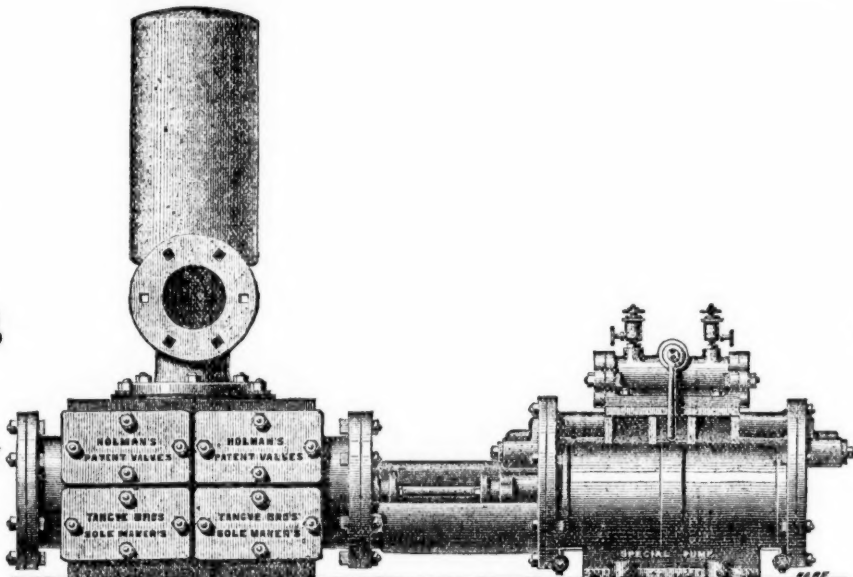
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Length of Stroke	Inches	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
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Diameter of Water Cylinder.....	Inches	6	7	8	5	6	7	8	9	5	6	7	8	9	10	6	7	8	9
Length of Stroke.....	Inches	12	12	18	12	12	12	18	24	12	12	12	18	24	24	18	18	18	24
Gallons per hour.....		7330	9750	13,000	5070	7330	9750	13,000	16,519	5070	7330	9750	13,000	16,519	20,000	7330	9750	13,000	16,519
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Diameter of Water Cylinder.....	Inches	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14	14
Length of Stroke.....	Inches	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour.....		20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000	40,000
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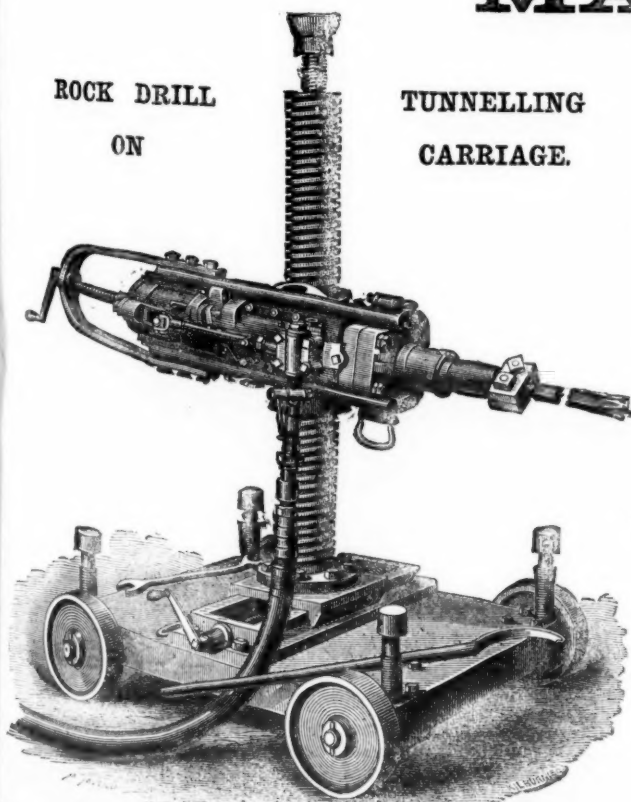
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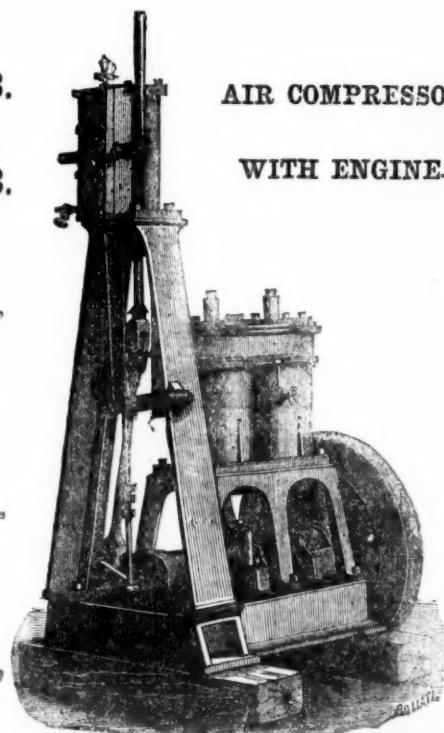
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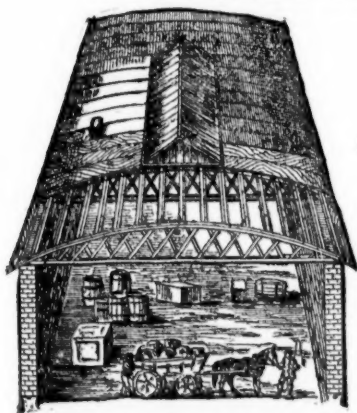
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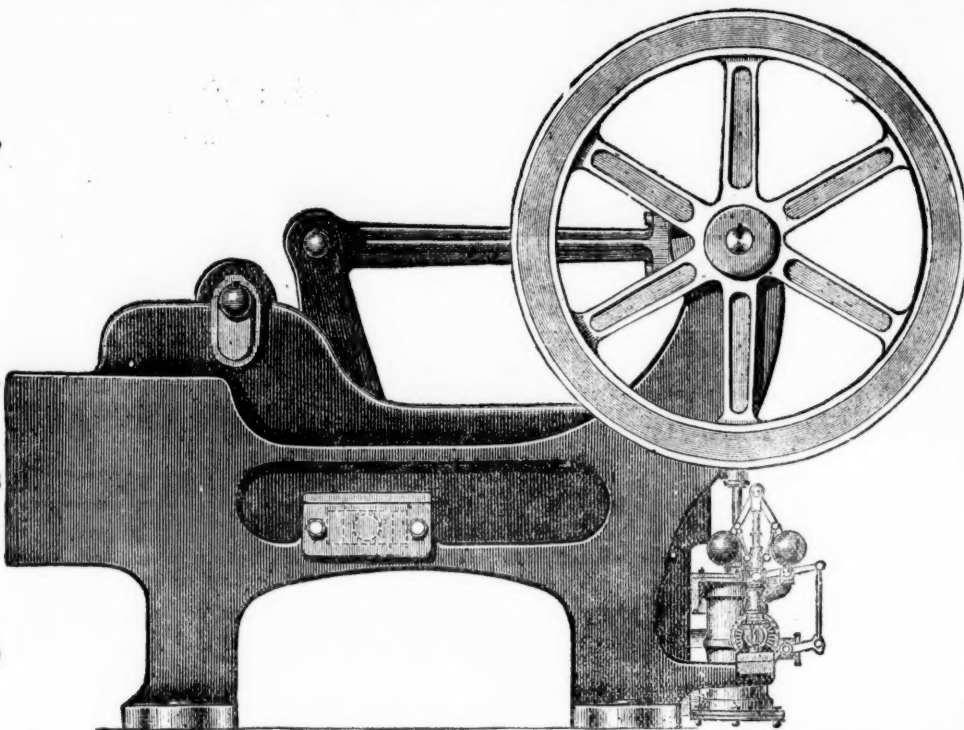
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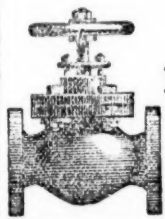
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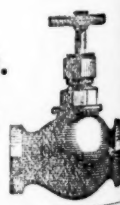
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